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BY

PROFESSOR SIR CLIFFORD ALLBUTT, M.D., F.R.S.,

PRESIDENT OF THE BRITISH MEDICAL ASSOCIATION.

GENTLEMEN, I have asked this patient to present himself here this morning in order that you may see a case of a very infrequent disease; I cannot recall more than four such cases, if indeed so many, in my own experience. The title of Huntington's chorea I retain because Huntington—a physician of New York—published, in 1872,[1] the first comprehensive description of the malady. It seems to have had some endemic prevalence in Long Island, New York, as Huntington's father and grandfather and other physicians in the district had observed and distinguished it. The Huntingtons laid much stress on the hereditary incidence. This record fell into neglect until 1884, when Ewald recalled attention to it. Many cases have since been described in both hemispheres, some with necropsy.[2] The alternative title of Hereditary Chorea I avoid because in many instances it has not been obviously hereditary, and no such condition is present in the case now before you.

At one of our Discharged Soldiers' Employment Committee meetings the last case on the day's list was of a man, X. Y., who had been sent from one hospital to another as a case of "neurasthenia"; and ultimately discharged. I was thinking it not worth while to wait longer for one of this crowd when the door opened in an irresolute way, and an arm was thrust through with a spasmodic jerk; then a leg followed with a like unsteadiness; then, while the right hand twitched at the handle, the corresponding body clinging to the door edged itself round with a random attempt to close it. Then with a stagger the patient lurched forwards to our table with the gait you have seen just now, a tripping staggering gait, hastening and stopping, until he reached the chair. Yet even in the chair you see, as we did, that the man is still in incessant restless motion, like a marionette; now jerking an arm, now the trunk of the body, now shrugging a shoulder, and so on, just as a girl does in St. Vitus's dance. We are told that these movements never cease except in sleep. He is not grimacing, he puts his tongue out fairly steadily, and his speech is unaffected; notwithstanding, the first glimpse of the patient should suffice to stamp his malady on the mind of the observer.

X. Y. lives in a village in this county; and I am much indebted to Dr. Sydney Williams of Meldreth for the trouble he has kindly taken in obtaining careful and complete notes of the case and in arranging for the patient to attend at the hospital this morning.

X. Y., aged 46, was born in our county. He joined the army and served in India for seven years. Then he served in S. Africa three years. His father died at the age of 80; always a healthy man. His mother died at the age of 55; cause unknown. They had three sons, all living, and the two others are in good health; one, aged 51, is an officer's servant, the other, aged 48, an agricultural labourer. There is no history in the family of "fits, St. Vitus's, or insanity." In respect of personal history patient had always enjoyed excellent health, and escaped all infectious diseases—in his own words "he never knew his own strength." He is a life teetotaler, and never had any venereal disease. In India he took part in athletics, and ran the half mile for his regiment. He smokes about half an ounce of tobacco a week.

When on duty one night at the front with a pioneer battalion, as Zeppelins were about, orders were given to man the trenches; and in making for the trench he fell into it—some 6 or 7 ft.; he fell on his right knee, but did not regard the blow seriously till a month later when the involuntary movements began on the right side. Within two months the disorder had attacked the left side also, and soon all his body and limbs were involved in it. There is no apparent mental defect, but the patient says that his "memory has suffered muchly." He cannot retain his urine as well as he did. There is one point, almost the only one, in Huntington's chorea in which the movements differ a little from ordinary chorea, namely, that in the earlier stages of the malady at any rate—as other observers of these cases have recorded—certain concerted movements may be performed with normal co-ordination; especially if the patient is tranquil and bent upon some task. Dr. Williams writes:—"I have noticed him in the road collecting dung for his garden, and when carrying the bucket and shovel the choreic movements are practically in abeyance." This occasional co-ordination, I repeat, agrees with records of other observers of this disease. One patient is said to have continued his occupation as a carpenter and to have "driven nails with fair precision." On the other hand, writing was almost impossible. The patient after much effort did succeed in making a sort of signature of his name, but it was scrambling and barely legible. The strength of his muscles seems unimpaired, at any rate as yet, and the tendon jerks were lively.

In short, this case corresponds in all respects with the recognized pattern of the malady, save as regards the absence of heredity. When heredity is apparent the malady has always been present in the preceding generation. There is a chorea described as senile chorea which comes on between the ages of 55 and 80, and is not hereditary. Other maladies affecting elderly persons, disorders of the nervous system, have been indiscriminately called chorea; such as athetosis, paralysis agitans, senile tremor, hysterical rhythmic spasms, and so forth. We can scarcely accept a limitation of the nomenclature by the element of heredity alone; but its absence may suggest a somewhat less gloomy prognosis. The incidence of Huntington's chorea falls rather more upon males, and usually about the age of 40.

Whether Huntington's chorea will prove to be identical with "senile" chorea I cannot say; we know too little of their respective natures and causes, but provisionally they should be regarded as one malady. It is said that both symptoms and morbid anatomy in Huntington's disease and in the "senile" are identical; though it is true that the occasional recovery from the "senile" kind, and perhaps the better preservation in it of the mental faculties, seem inconsistent with a parenchymatous degeneration attacking the neurons primarily, or very early. But these cases of alleged recovery are as yet imperfectly verified. Moreover we must not give the name of chorea to the common tremors and shuffles of elderly people with arterial and other senile degenerations. In these the motor instability is of another order. The descriptions of "senile" cases too often contain other forms of disorder, such as post-hemiplegic spasms, athetosis, shaking palsy, tics, festination, myoclony, etc. The patient before us is no degenerate. It cannot be too clearly understood that in Huntington's chorea the muscular eccentricities are of the same order indeed as in Sydenham's chorea. By these alone the two kinds cannot be discriminated. One is tempted to say that all chorea proper results from interference, temporary or persistent, in the same (Rolandic?) area.

The last case of Huntington's chorea I saw was in Tunis. I happened to be at the window of my hotel, which looked on a narrow lane, when I saw a native, evidently afflicted with this malady, shuffling along and edging himself for support against the opposite wall. The movements as he walked became more and more violent, until, feeling himself shaken off his legs, he backed into a doorway, where leaning against the doorpost he scuffled down into a sitting position; there the poor fellow sat twitching, jerking and grimacing until in a few minutes the violent phase passed off; then, scrambling to his feet, he staggered off. I followed after him but failed to catch him. Accordingly I asked X. Y. if at times the agitation became such as to shake him off his legs, and he and his son—without whom he does not venture abroad—said at once that such was often the case with him.

The prognosis, even if the case be not inherited, is very grave; the muscles of mastication and speech become affected, and gradually, after many years it may be, the mind falls into degeneration, so that after many years, directly or indirectly, it proves mortal, the last phase being one of utter wreck. If in this case the fall were the cause of the attack, the outlook may be better than in a case of "spontaneous" origin; the symptoms may abate, and the tissue changes be arrested. No remedies known to us are of any value; scarcely even palliative. The

pathologists who have had the opportunity of examining the nervous centres after death tell us that distinct marks of feebly inflammatory decay are not inconspicuous in the brain; the spinal cord being normal. Especially in the Rolandic area signs of a slow pia-arachnitis are found, with degeneration of the cortical cells and some chronic cell proliferation. There are no affinities of this disease to rheumatic fever, but it would seem to be a result of some infection. In this case, as in others of the kind, the heart is unaffected. The causes of the malady are in complete obscurity; the discussions of its antecedents in the textbooks are trivial.

REFERENCES.
[1] *Medical and Surgical Reporter*, Philadelphia, 1872, xxvi, 317.
[2] In England by Suckling, Midland Medical Society, 1889.

THE NECESSITY FOR FULLER CONSIDERATION OF THE LOCAL PROCESSES OF DISEASE AND REPAIR IN THE TREATMENT OF PULMONARY TUBERCULOSIS.

BY
H. MORRISTON DAVIES, M.D., M.C.CANTAB., F.R.C.S.,
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THE recent discussion at the Medical Society of London, together with the leading article in the BRITISH MEDICAL JOURNAL of December 8th, 1917, have served to focus attention on the fact—which has been becoming increasingly plain for some time—that the sanatorium treatment of pulmonary tuberculosis is not fulfilling all the hopes of those who believed that in it a really satisfactory treatment had at last been attained, and that by it the therapeutic problem of consumption had been definitely solved. The method has had a long and thorough trial, but it must now be recognized that the results of it are not such as to justify us in continuing to regard it as a standard method, adequate to deal with the disease with reasonable success, and without radical improvement or addition. We cannot say that in the average case treated by sanatorium methods complete and permanent cure is the normal event. In any given case the result of the treatment is uncertain and extremely difficult to foretell; the immediate mortality remains considerable, the ultimate mortality large, while our power of completely arresting the disease and of restoring the patient to active life is still disappointingly capricious. While we are able in a large number of cases to produce the most gratifying improvement in the general condition and diminution of the symptoms, it must be admitted that the tendency to the persistence of some few signs or symptoms and to ultimate relapse after the resumption of working conditions are disappointingly common.

It is the object of this paper to inquire into the significance of the comparative failure of sanatorium treatment and to indicate some principles which that treatment ignores, but which must be taken account of before we can hope to establish a method in any sense definitive.

GENERAL PATHOLOGICAL CONSIDERATIONS.

In dealing with the problems presented by the treatment of pulmonary tuberculosis it is necessary to keep in mind constantly and vividly the general pathological features of the disease. Certain broad and quite elementary features of the processes involved in the disease will therefore be recalled. The application of these facts is so obvious, and seems when written so helpful, that no apology will be made for giving some account of them here. A familiarity with the pathology of consumption is usually taken for granted, and is therefore but little referred to in discussions upon treatment. A critical consideration of such discussions will, however, frequently reveal evidence that such pathological elements are, in fact, not always kept steadily and clearly in mind, and even that the appreciation of them is sometimes imperfect or confused.

The tubercle bacillus, when it infects man, shows itself to be an organism of slight general toxicity and slight local virulence. It does not in itself produce marked constitutional symptoms and the fever that it so commonly causes is benign even when considerable in degree; similarly, the presence of the organism in the tissues has remarkably little direct destructive effect (as compared with the pyogenic organisms, for example), but rather stimulates them to produce a special tissue, the function of which is to surround and destroy the invading micro-organisms. This special tissue is, of course, granulation tissue and constitutes the well-known granuloma of tuberculosis. It is essential to grasp clearly the peculiarities of this tissue. It has no feature peculiar to tuberculosis, but is the normal response of the body to a mild continuous irritation. The function of the granuloma is to dispose of the irritant by destroying it, and its destiny, like that of all other granulation tissue, is, when its work has been accomplished, to be converted into fibrous tissue. If a few tubercle bacilli be introduced into a healthy tissue, the normal sequence of events is the formation of a granuloma round the bacilli, the destruction of the latter by the granuloma, and the direct development of the latter into a small healthy scar. Now we can define with fair precision the conditions necessary to ensure this sequence of events: (1) The *general resistance of the patient* to tuberculosis must be good; (2) the *dose of the organism* must be reasonably small; and (3) the part infected must be kept under certain local conditions known to be favourable to cure, of which by far the most important is a state of rest. When these three requirements are not satisfied the granuloma as a protective mechanism fails and becomes itself an agent of injury. Supposing such a failure to occur either from low general resistance, largeness of the dose (or what may virtually be the same thing, exceptional virulence of the organism), or unsatisfactory local conditions, the result is a progressive enlargement of the granuloma.*

This has two important consequences:

1. The granuloma enlarges at the expense of the surrounding healthy tissues, which it attacks and destroys, as it were to make room for itself, with a vigour approaching that of a malignant tumour. This is the mechanism whereby tuberculosis produces its destructive effects, which are then seen to be part of the actual defence against the disease. As is well known, the destructive effect of the enlarging granuloma is not equal against all tissues and is apt particularly to be restrained by any dense fibrous membrane and by the parietal pleura—a feature which is one of the few absolutely characteristic of tubercle.

2. The granuloma from its very nature draws its blood supply chiefly from capillaries, any other vessels it may receive being very imperfectly developed. The consequence is that when the granuloma reaches any considerable size the central parts become very feebly nourished and therefore undergo fatty degeneration with consequent caseation and liquefaction. As long as caseation has not occurred, direct conversion of the granuloma into fibrous tissue is still possible under favourable conditions; recovery with loss of tissue but without loss of substance then takes place. When caseation has occurred there is necessarily loss of substance as well as loss of functioning tissue. There is thus actual cavity formation, and recovery is no longer possible without diminution in volume of the affected part. When the irritation caused by the micro-organism is very mild the tendency to the direct conversion of the granuloma into fibrous tissue is very strong and is in action continuously, even though the disease is progressing. The lesion then much more closely resembles the syphilitic gumma than the traditional caseous tubercle. This continuous fibrous transformation is probably the mechanism that leads to fibrous phthisis and the fibrosing tuberculosis of lymphatic glands.

The fibrous tissue into which the successfully resistant granuloma ultimately is transformed tends, of course, to contract and to diminish the volume of the affected part, even although there may have been little or no caseation and loss of substance. Diminution in volume of the lung is thus seen to be an essential feature of recovery from phthisis; it is, as we have seen, rendered necessary in two ways—through actual loss of substance of the organ in consequence of caseation, and through the contraction which must accompany the conversion of granulation tissue into a mature and healthy scar. So essential a part

* I set aside for the moment the possibility that the failure of local control of the disease may be so complete that a generalized tuberculosis occurs.

of this conversion is the process of contraction that if the latter be prevented the actual formation of fibrous tissue will ultimately be arrested. This can often be seen in cases of chronic ulcers surrounded by much rigid induration or fixed to a bone. Here the inability of the newly formed fibrous tissue to contract is often demonstrably the sole cause of the arrest of healing. Thus some shrinkage of the lung is an essential part in the actual process of recovery. If the necessary shrinkage is no more than is rendered possible by the falling in of the chest walls, costal, phrenic, and mediastinal, and other circumstances are favourable, recovery proceeds satisfactorily. If the necessary shrinkage is greater than can be readily and without undue delay compensated thus, the contraction, which naturally always tends more or less to pull on the walls of the intra-pulmonary bronchi, must now occur chiefly by means of this factor. Thus when shrinkage is embarrassed not only is the actual healing of the tuberculous process unfavourably affected, but a complication—distortion and dilatation of the bronchi—is apt to be set going, which may, even if the patient is able completely to throw off his tuberculosis, prove as disabling as the primary disease.

One further fact in the natural history of scar tissue should perhaps be borne in mind: While contraction is indispensable during the formation of a healthy scar, such fibrous tissue once formed and fully mature can by constant and gentle tension be stretched permanently to almost any degree.

Factors of Treatment.

The foregoing pathological considerations have indicated that there are three main lines along which the treatment of pulmonary tuberculosis must be discussed: (1) The influencing of the general resistance of the body to tuberculosis. (2) The means whereby the local conditions can be made favourable to the healthy evolution of the granuloma as a defensive mechanism. (3) The special importance in the case of the lung of the contraction which accompanies all healthy scar formation and the necessity of providing for its occurrence if healing is to be satisfactory and bronchial deformation to be avoided. We thus have three fairly distinct problems to consider—the general problem, the local problem, and the mechanical problem.

The General Problem.

Sanatorium treatment as such concerns itself solely with attacking the disease through increasing the general resistance. The avoidance of reinfection and intercurrent respiratory infections, the hygienic life, and the use of exercise, are its chief weapons. We have enough evidence to-day to conclude that powerful as these weapons are they are not able in an average case to guarantee success or to obtain it often enough to enable us to hope that any degree of detailed improvement in the method will give us a definitely effectual treatment.

The subject of the general resistance to tuberculosis in man is still very far from being fully understood. It is probable that most people living under the conditions of present day Western civilization are infected with tubercle at one time or another, though in the great majority the disease never becomes recognizable during life. It is to be presumed that the development of clinically recognizable tuberculosis is an evidence of a resistance less than normal. We may suppose that, occasionally, a power of resistance greatly below the normal is inherited. Such individuals would be found out by the disease early in life, and they probably account for the cases of general tuberculosis of infancy and early childhood.* Those who escape this danger otherwise than by mere accidental avoidance of infection are to be regarded as having a definite general resistance to the disease. In the great majority of people this resistance is strong enough to crush any early infection before it becomes clinically recognizable. In a minority the resistance must be near or below the point where this extinction of the disease in a larval stage is possible. Such persons are those who develop clinically recognizable phthisis. Cases of very rapid and intractable disease probably represent individuals in whom the resistance is exceptionally low, and near the point that would permit of a primary generalized infection. Intermediate degrees of immunity will produce types of the disease of corresponding severity. At the top of the class will come individuals whose resistive powers are nearly adequate to deal effectively with an infection in its larval period. Now there is a good deal of evidence that the general resistance to tubercle varies, within limits, with the general health of the individual. The improvement in the general health effected by sanatorium treatment progresses in certain favourable cases *pari passu* with improvement in the disease. It is probable, therefore, that the (comparatively limited) class of cases curable by sanatorium treatment is made up of individuals whose resistance is nearly or quite normal—that is, who are by nature nearly or quite able to dispose of the infection in its earlier stages, but who have had their resistance temporarily depressed by a decline in general health with which the infection has coincided. It is to be feared that this class is limited, for the concurrence of circumstances necessary to produce it is somewhat complex—namely, a natural resistance quite near the normal, a depression of this resistance through the general health, and the acquisition of the infection just at this moment.

That the effect of the general health in heightening the resistance to tubercle is quite limited is shown by the numerous cases in which, under sanatorium treatment, there is a great improvement in the general health and no corresponding improvement in the disease. Here we may suppose the natural resistance to be low and quite outside the narrow range of influence of the general health.

The Local Problem.

It is a fact very familiar to surgeons that in cases of so called surgical tuberculosis in parts subject to movement, such as bones, joints, and tendon sheaths, immobilization of the part has a remarkably favourable effect on the disease. Without any other treatment it may render the granuloma completely effective as a defensive mechanism, causing it to cease to enlarge, to become less liable to caseation, and to undergo fibrous transformation in the normal way. General treatment to raise the power of resistance is by itself quite useless in these cases, and no surgeon of experience, if compelled to choose in a given case between it and immobilization, would hesitate for a moment in preferring the latter. Doubtless general treatment reinforces local treatment strongly, and should, of course, always be used if possible, but the indispensable condition for recovery in a part subject to movement is immobilization. There is no reason to suppose that these principles are not equally applicable to tuberculosis of the lung. The element of motion in the affected part is even more conspicuously present than in the case of a joint. That general treatment alone is sometimes effective in spite of continued movement suggests that the lung, probably on account of its vascularity, is naturally unfavourable to the disease; that general treatment alone frequently fails suggests that the local factor, which is indispensable in the case of a joint, is also necessary here. Surgeons have learnt that the immobilization of a tuberculous joint to be efficient must be absolute, and the same may be expected to apply to the lung. It is certain that the relative diminution of movement obtained by keeping a patient in bed has no claims whatever to be regarded as possessing any of the qualities of true immobilization as applied to a joint.

The Mechanical Problem.

It is a fortunate coincidence that the means whereby alone can be effected the institution of absolute rest in a diseased lung are also the means whereby the requirements of healing and the solution of the mechanical problem can best be met. The collapsed lung is not only immobilized but is in a condition to undergo the necessary shrinkage which accompanies the formation of healthy fibrous tissue; thus are promoted by one and the same measure the effective functioning of the granuloma as a protective mechanism, its due transformation into fibrous tissue when its function is fulfilled, and the prevention of the transformation leading to that distortion of the internal structure of the lung which is so apt to cause a permanent and disabling bronchiectasis.*

* Apart from its occurrence in early life, general tuberculosis seems mostly to be a terminal phenomenon, setting in only when the general resistance has been broken down by very extensive local disease.

* The importance of the mechanical factor and of the treatment of it is so great that I have dealt with it separately in another paper published in the *Quarterly Journal of Medicine*, April, 1918.

The effect of each of the four methods of treatment which I shall mention directly is to put the whole or part of the lung either temporarily or permanently out of action, and at the same time to compensate for the mechanical disabilities which have been produced by the morbid changes. Two of these methods have for their object the collapse of the whole of one lung; they are nitrogen displacement, which collapses the lung only, and rib mobilization, which collapses the lung together with the chest wall. The other two influence a part of the lung only; the one is division of the phrenic nerve in the neck, which produces paralysis of the diaphragm and is followed by immobilization and a partial collapse of the lower lobe; the second is the local replacement of one part of the lung, usually the apex, by a foreign body (Tuffier).*

Nitrogen Displacement.

Although each of these methods reduces the mobility and compensates for the disabilities caused by the mechanical factor, yet the selection of the type of case which will benefit by any of these methods of surgical intervention, and the choice of which method will produce most efficient results, is a matter of great importance. The lack of greater appreciation in this country of the value of the simplest even of these four procedures, nitrogen displacement, is the result of an imperfect realization of the character of the pathological processes and of the seriousness of the mechanical disabilities, and of the fact that the effect of the treatment is directly antagonistic to the further development of the former while at the same time it compensates for the latter.

The effects of the collapse of the lung are, as I have said, twofold. In the first place, it arrests in that organ the movements associated with respiration, and, as collapse is followed by a striking diminution in the symptoms, it reduces greatly the very active and sudden movements which accompany the acts of coughing and expectorating. As the granulomata are, therefore, no longer subject to continual irritation and injury by the movements of the tissues in which they are situated, they are able to perform their protective function, the fibrosis is able to overtake when their work is done, and to convert them into healthy fibrous tissue. In the second place, the collapse allows the newly-formed fibrous tissue to contract. It prevents, therefore, the constant drag on and the distortion of the surrounding walls, and, more important still, the bronchial deformation. It allows also of the obliteration of cavities in the bronchi or parenchyma and so abolishes the absorption of the products of secondary infection; the beneficial effect of this on the constitution and so on the power of resistance is obvious.

An extensive invasion of both lungs by tubercle is the only contraindication which I recognize to the treatment of this disease by nitrogen displacement. If the facts which I have stated above are accepted, it must necessarily be allowed that it is the extensiveness only, and not the slightness of the lesion, which constitutes a grave and serious objection to the attempt being made. The problems how early a case and how soon after the symptoms have been recognized nitrogen displacement should be tried will probably remain subject to controversy for many years. So long as a case is an "early" one—that is, so long as the diminution in the volume of the lung can be balanced by processes of nature (the approximation of the boundary walls and emphysema of the adjacent healthy lung)—there is no *necessity* for artificial means to compensate the disabilities due to the mechanical factor. But there is still the local problem—the granuloma—which must be considered. It may be, in a given case, that improvement in the general health and the moderate increase in resistance this can effect, will be sufficient. If, however, the symptoms and the signs indicate that there is delay or incompleteness in the fibrosis of the granuloma, more complete rest of the lung by surgical intervention is undoubtedly indicated.

Another argument in favour of the early treatment of pulmonary tuberculosis by nitrogen displacement is that the longer it is postponed the more probable is it that the collapse of the lung will be incomplete or impossible owing to adhesions. Interpleural fibrosis often interferes greatly with the treatment. If, however, the adhesions are few and are accessible for division, or can be stretched sufficiently to enable the lung to be reduced to about half its volume, great benefit may be expected and can be obtained from the partial collapse.

Rib Mobilization.

This is an alternative method of treatment, but as the collapse of the lung and the chest wall is permanent, and as the operation is much more serious, it must be considered only when collapse by nitrogen is impossible. All cases which can be treated by nitrogen displacement are not suitable for rib mobilization. Much more rigid selection is necessary, and active disease in the opposite lung is an absolute contraindication. The immobility of the lung obtained by rib mobilization is more complete than that obtained by nitrogen, as the variations in the size of the organ due to the absorption of gas from the pleural cavity and the periodic refills are absent.

Division of the Phrenic Nerve in the Neck.

This operation is followed by paralysis of the diaphragm on the same side. The dome rises up into the thorax one or one and a half inches above the normal level. During quiet respiration it is motionless, but during a deep inspiration it may ascend still further into the chest. The movements of the lower lobe are controlled by the diaphragm. Paralysis of this muscle abolishes, therefore, the movements of the base of the lung, and at the same time produces partial collapse. This operation is of great value under the following circumstances:

1. When there are extensive secondary changes (mechanical and infective) in the lower lobe.
2. To diminish movement in the lower lobe when it is the seat of primary tuberculous disease.
3. To prevent the aspiration of infective material (tuberculous or pyogenic) from the upper into the lower lobe.
4. Although it is not germane to the subject of this paper, it should be added that paralysis of the diaphragm may be of considerable value as a prophylactic measure against the development of bronchiectasis in cases of chronic interstitial pneumonia.

Insertion of Foreign Body.

Tuffier advocates local collapse of the lung by separating the parietal pleura from the chest wall, and filling the space thus formed by a foreign body, such as a lipoma or fibroma.

It is frequently stated that one of the great barriers to success in the sanatorium treatment of pulmonary tuberculosis is the desire of or the necessity for the patient to return to the environment in which he was when he contracted the disease. The conditions which surround the individual when he returns to his work can rarely be so favourable for maintaining the degree of resistance to the disease acquired while under treatment. His reserves become exhausted by overwork, underfeeding, irregular hours, anxieties, or infection such as cold or influenza, and the granuloma once more fails in its defensive function. It is clear, therefore, that when the treatment is confined to improvement in the general health of the patient and to increase in the resistance only it is unsatisfactory, and in a large majority of cases the benefit which is obtained must be temporary in character. But when the lung is collapsed by nitrogen, the tuberculous lesion is set at rest and the mechanical disabilities are compensated, the patient is to quite a considerable extent independent of those fluctuations in his general health which are inevitable. Once, moreover, the initial treatment is completed, he can return to his work and can lead a comparatively normal existence with much greater safety to the community and with at the same time a much more considerable hope of maintaining and of securing the improvement which he has acquired, and possibly even of becoming the master of, instead of the slave to, the disease.

* I have already dealt with the details of the technique of all these methods in various other articles: "The therapeutic value of gases introduced into the pleural cavity," BRITISH MEDICAL JOURNAL, April, 1914; "The operation of rib mobilization in the treatment of phthisis," *British Journal of Surgery*, vol. ii, 1915; "The importance of the mechanical factor in the treatment of pulmonary tuberculosis," *Quarterly Journal of Medicine*, April, 1918.

THE IMPORTANCE OF REGULATING THE FAT-INTAKE IN DIABETES MELLITUS.

BY

P. J. CAMMIDGE, M.D.LOND.

THE dietetic treatment of diabetes mellitus has passed through three stages, progressing from a simple problem with one unknown quantity to its present position of a complex investigation involving the determination of at least two additional factors.

The first stage was initiated by the accidental discovery made by Rollo, in 1797, that glycosuria could be controlled by the exclusion of vegetable foods from the diet, but it was not until the relation between the digestion of carbohydrates and the formation of sugar was established by Gmelin and Tiedemann, in 1838, that the treatment of the condition by limiting the carbohydrate intake was placed on a rational basis. The discovery by Lépine and Barrah, in 1891, that sugar could also be derived from proteins paved the way for the second stage in the treatment, for their experiments and the clinical observations of Kolisch and Schumann-Leclerq (1903) showed that regulation of the protein as well as the carbohydrate is necessary if the progress of the disease is to be checked, especially in severe cases. Until very recently the third important constituent of the diet, fat, has been regarded as a comparatively innocuous food for diabetics; they have consequently been given it in large quantities and encouraged to consume as much as possible with a view to maintaining their weight and, if possible, increasing it. The most recent experimental and clinical investigations have shown, however, that control of the fat allowance is quite as important as regulation of the carbohydrate and protein intakes if a gradual failure of metabolism with ultimate return of the glycosuria and progressive acidosis are to be guarded against.

Diabetic Lipaemia.

When phlebotomy was commonly practised it was known that the blood in severe cases of diabetes occasionally had a milky appearance, and that on standing a creamy layer of fat separated out on the surface. Although such a condition of lipaemia is very rarely seen in any other disease than diabetes no great importance has been attached to it, save that it indicated a grave prognosis, and until recently no attempt has been made apparently to study the fat content of the blood systematically to discover the antecedent stages and ascertain whether an excess of fat, without obvious lipaemia, existed in all cases of diabetes. The first comprehensive series of cases in which such an investigation was carried out was reported in 1916 by Bloor,[1] who had previously studied the fat content and relations of the blood in a number of normal individuals and other pathological conditions by methods specially developed for the purpose, and so was in a position to make reliable comparisons. He found that out of the thirty-eight diabetics investigated a lipoid value of the blood in excess of the normal average was present in thirty-six, and in all but three of these it exceeded the highest limit met with in healthy persons, in spite of the fact that a characteristic milky appearance was found in only two instances. A marked increase, up to 100 per cent. or more of normal values, was found in all the severe cases, but clinically mild cases also sometimes showed considerable abnormality. As a rule, however, the more severe and long-standing the diabetic condition the more marked was the abnormality in the blood lipoids.

From these results it would appear that an excessive lipoid value of the blood is very common in diabetes, and that it may be regarded as an almost constant phenomenon of the diabetic condition. This being so the questions that arise are: What is the source of the excess of fat? and What is its significance? The evidence at present available suggests that it originates mainly in the fat of the food, and that the probable reason for its appearance in the blood is a partial failure of the mechanism for dealing with fat arising from the essential nature of the diabetic state, like the associated defects in carbohydrate and protein metabolism. The dependence of lipaemia on the fat content of the diet was well shown in Bloor's two cases of obvious lipaemia, which promptly cleared up when a fat-free diet was substituted for the fat-rich diet they had been taking previously; and similar observations have been made by Allen, who has pointed out that dogs rendered diabetic by partial removal of the pancreas rarely show lipaemia unless precautions are taken to ensure good digestion, and that it then varies with their digestive powers, appearing readily on feeding them with fat and ceasing promptly on its omission. Allen has shown also that the excess of fat in the blood in diabetes is not due to hyperglycaemia, nor solely to removal of pancreatic tissue, and that absence of carbohydrate or loss of sugar from the body do not appear to be responsible for the condition, since maximal phloridzin poisoning followed by feeding with nothing but fat in dogs fails to produce anything resembling diabetic lipaemia. Bloor found that there was no definite relation between high blood lipoids and the occurrence of acetone bodies in the urine, although he points out that maximal lipaemia probably never exists without acidosis, because acidosis goes with the general severity of the diabetes. That diabetic lipaemia is not due to change in the reaction of the blood is indicated by the fact that the greatest possible reduction in its carbon dioxide capacity by acid poisoning produces no characteristic change in that direction. It would therefore seem that the tendency to the imperfect utilization of fat in diabetes is not dependent upon any other feature of the disease, but is a primary phenomenon of the condition which appears to vary independently of the other symptoms, although its extent corresponds roughly to the severity of the disorder.

Ketonuria.

The existence of an excess of lipoids in the blood in most cases of diabetes suggests that the mechanism by which fat absorbed from the bowel is taken up by the cells of the body is usually more or less at fault, but there is another point in fat metabolism at which failure frequently occurs also—namely, its oxidation in the tissues. This is indicated by the presence in the blood and urine of imperfectly oxidized products in the shape of the acetone bodies (acetone, aceto-acetic acid, and beta-hydroxybutyric acid), which have been aptly likened by Woodyatt to the smoke from a badly burning candle or fire. The work of Rosenfeld, Hirschfeld, Geelmuyden, Magnus-Levy, and others has shown that the principal source of the acetone bodies is fat, and it may be taken as proved that the presence of acetone and its associates in the urine and blood is mainly influenced by the amount of fat in the tissues, and hence in the food.

It is well known that the fasting human subject shows ketonuria, and that the available store of fat in the body is one of the chief sources of the condition under such circumstances was strikingly demonstrated by the experiments of Folin and Denis[2] with fasting obese women in whom marked acidosis and serious symptoms of acid poisoning corresponded to the rapid loss of weight resulting from starvation. Ketonuria likewise results from simple carbohydrate abstinence, and it would seem that a certain proportion of available carbohydrate is necessary for the complete and orderly combustion of fat by the tissues. According to Zeller,[3] a molecule of sugar must be oxidized for each two molecules of fat, which would mean in a normal individual the ingestion of one part of carbohydrate for each four parts of fat. If carbohydrate is not available the sugar derived from the constituent amino-acids of proteins may be used, and it is for this reason that proteins are antiketogenic in normal persons. They are less efficient for the purpose than carbohydrates, for some amino-acids are themselves capable of giving rise to a considerable proportion of acetone bodies. In the diabetic subject the degree to which fat is completely utilized depends upon the relation between the power possessed by the tissues of making use of the sugar offered to them and the amount of fat taken in the diet, or stored in the body. If carbohydrate foods are comparatively well metabolized, a considerable amount of fat can be burned without "smoking" or giving rise to acidosis; if the defect is more pronounced and only a small quantity of carbohydrate can be made use of, a proportionately smaller quantity of fat can be taken without being imperfectly oxidized, while if the tolerance for carbohydrate is slight ketonuria and acidosis occur with even a small amount of fat in the diet, or with no fat at all, since more or less of the carbohydrate of protein

origin is probably also being excreted in the urine as sugar, and there may not be sufficient available to suffice even for the complete oxidation of the protein fractions that give rise to acetone bodies.

It may consequently be taken as a general working rule that fat unbalanced by an adequate available supply of other foods is poison to the diabetic, and it therefore follows that the craving for bread and other starchy foods shown by patients on a high protein-fat diet is rather an expression of a natural want hitherto misunderstood than an evidence of original sin that can be dealt with more satisfactorily by restoring a proper balance in the diet by reducing the fat than by increasing the carbohydrate, as is usually taught. Owing probably to a latent reserve power possessed by most people, diabetics can generally be trained to utilize gradually more fat, but their reserve power in this respect is not unlimited, and, like the tolerance for carbohydrates and proteins, is easily overstrained, with rapidly increasing acidosis and death from coma.

Fat and Sugar Utilization.

A third aspect of the fat problem in diabetes that has been reinvestigated lately is the influence exerted on sugar utilization. It has been contended by some writers that sugar can be formed from fat, since the addition of fat to a diet that has previously been well borne may increase the glycosuria in diabetes; but the experiments of Ringer, Allen and DuBois, and others are strongly against such a transformation taking place in animals or man, so that some other explanation must be sought. Recent experiments carried out by Allen [4] appear to have solved the mystery. He found that if two dogs are made diabetic by removing corresponding portions of the pancreas from each, and, after their carbohydrate and protein tolerance has been determined, one is given only just sufficient fat to prevent loss of weight, while the other is allowed as much as he will eat, or is forcibly fed with fat, the former, although thin and always hungry, will remain sugar-free, whereas the other gains in weight, appears healthy and happy, but eventually develops glycosuria, with ultimately fatal results, unless the fat feeding is promptly stopped and he is starved until the glycosuria is controlled. Contrary to what might have been expected if fat were transformed into sugar in the body, examination of the blood of such dogs shows that the first effect of adding fat to the diet is to reduce the percentage of sugar. As the fat feeding is pushed and the weight of the animal increases, a parallel rise in the level of the blood sugar takes place, however, and finally glycosuria occurs. An abnormally high blood-sugar level may exist for some time before sugar appears in the urine, and persist for a considerable interval after all fat has been omitted from the diet, suggesting that an excess of fat reduces the permeability of the kidneys for sugar, and showing that its evil effects continue long after the cause has been removed, thus probably explaining the diminishing glycosuria, without a corresponding fall in the blood sugar, of chronic cases of diabetes kept for long on a diet with a high fat content.

These experiments have been repeated under such a variety of conditions and with such adequate controls, always with similar results, that it seems reasonable to conclude that the hyperglycaemia and glycosuria following excessive feeding with fat are due to a failure of metabolism consequent on the gain in weight above what the defective assimilative functions of the animal are able to cope with, and that any attempt to induce a high level of nutrition with fat results in an aggravation of the diabetic condition similar to that which follows a like attempt with carbohydrate or protein, although its effects are slower and more insidious.

Applications to Treatment.

The application of the results of the observations outlined above to the clinical treatment of diabetes mellitus obviously entails the forsaking of several cherished beliefs and standards. It will also involve very considerable modification in current methods of determining and regulating the diet, even the most modern. We can no longer consider that we have done our duty by our patients if we have merely rendered their urine sugar-free by limiting the carbohydrate intake or adjusted the protein allowance to their metabolic capacity; we must now also ascertain the optimum amount of fat which will meet their needs, prevent acidosis, and avoid the onset of glycosuria, either immediately or in the future.

The prevention and control of acidosis is so often a matter of primary importance when patients come under observation that it will be well to consider it first. It has long been known that it is dangerous to change a severe case of diabetes suddenly from an ordinary mixed diet containing carbohydrate to one consisting of protein and fat alone, as serious acidosis may develop, but it does not appear to be generally recognized that it is often equally dangerous to deprive a patient of all food and adopt the fasting treatment without adequate preparation. In order to prevent acidosis occurring, and avoid increasing it when already present, the chief source of the acetone bodies, fat, should first be eliminated from the diet as far as possible. After a day or two on a fat-free diet the carbohydrate may generally be reduced with safety, but it is not wise to leave out all carbohydrate until the protein intake has also been brought down by at least half. Both carbohydrate and protein may then be gradually reduced until a diet of low-value green vegetables only is being taken, when, if the glycosuria still persists, actual fasting may be instituted without fear of grave complications developing. When the diet is being built up again and the patient's tolerance is being tested after the glycosuria has been controlled, fat should be introduced with equal care, none being allowed at all until a fair tolerance for carbohydrate and protein has been established. The fat content of the diet, like the carbohydrate and protein, must then be worked out each day and the effect of every addition be carefully watched.

Unfortunately the results of analyses of the urine do not afford information that is of much help in regulating the allowance in many cases, although variations in the total acidity, true ammonia nitrogen, calcium, and magnesium excretions, with increase in the total output of acetone bodies may give useful indications in some instances, and show that the fat is being increased too rapidly. As a rule the most reliable information is given by examination of the blood. Allen's experiments on dogs have shown that a rising blood-sugar curve with increasing weight when fat is being added to the diet indicates approaching failure of metabolism with eventual glycosuria, but earlier and more certain information that the mechanism for dealing with fat is being overloaded can be secured by estimating the lipoid value of the blood by Bloor's method or, since it has been found that the cholesterol increases parallel with the fat, by cholesterol determinations. When the apparatus and time for blood analyses are not available, the fat allowance must be regulated by the patient's weight and the appearance of sugar in the urine.

It must be borne in mind, however, that weight is not necessarily a true index of the tissue mass of the body as it is influenced by accidental circumstances, particularly loss and retention of water, and that glycosuria is a late symptom of failure of metabolism due to excess of fat in the diet.

If sufficient care is taken, glycosuria can usually be avoided if the fat-intake is so adjusted that, while further loss of weight is guarded against, progressive gain is prevented. This ideal, which should be aimed at in all cases, is quite contrary to the older teaching, according to which increase in weight was, above all other things, the most desirable for a diabetic, since it was considered that gain in weight meant gain in strength also. That such is not really the case has been shown by the experiments of Williams [5] with the Collin dynamometer. It appears from his results that, as a rule, diabetics are physically distinctly weaker than normal persons, owing partly to loss of musculature, but also probably in consequence of the diminished supply of energy furnished by the imperfectly utilized food to the muscular mechanism they possess so that it is incapable of functioning normally. There appears to be a direct relation between the food tolerance and the muscular vigour of the patient, and if the tolerance is depressed by the continued use of a diet beyond his metabolic capacity further decline in the physical powers takes place, whereas if the food tolerance is increased by the employment of a diet within the physiological limitations of the individual, even though it falls far short of the theoretical energy requirements of

the body, an appreciable increase in muscular tone occurs.

Overfeeding, therefore, is not only a cause of glycosuria in diabetes, but also results in a progressive failure in metabolism with loss of strength. It appears to matter little whether the excess of food is in the form of carbohydrate, or protein, or even fat—the outcome is the same; but as the effects of an excess of fat are more insidious and difficult to recognize in the early stages it is necessary that particular care should be taken in regulating the fat allowance. Since I realized that fact and applied it in my clinical work I have obtained much better and more permanent results than formerly. It has also enabled me to recognize and deal with cases of recurrent glycosuria that would otherwise have been puzzling. As an example I may quote the case of a boy of 14 who was brought to me in October, 1916, by Dr. J. Howard Cook.

When he was first seen by Dr. Cook he was passing about 100 grams (5.5 per cent.) of sugar a day, but when he came to me the sugar excretion had fallen to about 10 grams a day. The patient's carbohydrate and protein tolerance were worked out, and he was put on a diet on which he remained sugar-free for about three months. A return of the glycosuria then occurred, but on his carbohydrate allowance being readjusted the sugar disappeared, and it remained absent for about four months. As the glycosuria then recurred it was evident that his carbohydrate tolerance was steadily falling, and the prognosis appeared to be bad. A further readjustment of both the carbohydrate and protein allowance kept him sugar-free for another four months, when sugar was again found. I went into the case very carefully with Dr. Cook, and we came to the conclusion that as the boy's weight was increasing more rapidly than would probably be accounted for by natural growth and a considerable amount of fat was being taken in the diet, it would be advisable to try the effect of reducing it. This was at once done, and I hear that he has since remained free from any trace of sugar although more starchy food has been taken, and that he has improved in strength and general condition.

The importance of a strict control of the fat content of the diet has been impressed upon me by a number of other cases, including several which had been submitted to the fasting treatment with immediately satisfactory results, but with ultimate return of the sugar. In some of these that have come under my care owing to the recurrence, I have found that an excess of protein was being taken, but in others careful chemical examination has shown that the fat content of the diet was the difficulty, and when it was adjusted to the patient's metabolic powers the glycosuria promptly ceased and did not return.

Patients who are steadily losing weight, as most diabetics are, naturally desire to put on flesh as quickly as possible, and are apt to judge the success or failure of any treatment they may undergo by the extent to which their wish is gratified; but, although we may understand and sympathize with their longing, it must not be gratified, and we should explain that gain in bulk is a sign of failure rather than of success. A steady weight that can be maintained without overtaxing the patient's defective metabolic powers should be aimed at, and any attempt to improve a bad situation by overfeeding, or even feeding up to the theoretical caloric requirements of the body, must be abandoned. Gain in weight must be sacrificed to well-being and satisfaction of the appetite to length of days. Individualization of the diet, in which the allowance of carbohydrate, protein, and fat is regulated by the tolerance of the patient for each, and by his powers of dealing with the diet as a whole, is the line along which the treatment of diabetes is developing, and, although it is very likely that we have not yet reached finality and that other considerations, such as the mineral content of the diet and the amino-acid make-up of various proteins, etc., will eventually have to be taken into account, it is clear that the older standards and empirical methods employed for so long are doomed, and will have to give place to scientific dieting based upon exact modern chemical research and knowledge.

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THE American Women's Zionist Organization announces that Mrs. Peter J. Schweitzer of Brooklyn has given £5,000 for the building and maintenance of a model eye hospital in Palestine. A medical unit has left for Jerusalem.

AN OUTBREAK OF PHLEBOTOMUS FEVER.

BY

CAPTAIN J. A. HARTLEY, M.D.DUBL.,
R.A.M.C.(T.F.).

AN outbreak of phlebotomus fever (sandfly fever) occurred in a squadron of yeomanry on outpost duty in mid-Egypt in the middle of the summer of 1917. The post was on the western edge of the cultivation, and I was in medical charge of the unit. Of the total strength 86.4 per cent. were infected. The first to contract the illness were the men, non-commissioned officers next, and officers last. The first case was discovered on the thirty-seventh day in occupation, and from this there were three or four fresh cases daily for a week, and an average of six daily in the second week. For medical reasons the unit then moved about a mile and a half to a new camp on fresh ground, and, although it was impossible to avoid carrying the infection, better conditions followed. For military reasons it was desirable to maintain occupation of the first position, and after taking preventive measures additional to what had already been followed, a guard drawn from another unit was placed in it. Four days had scarcely elapsed when the non-commissioned officers and men who formed this presented symptoms of infection, and the illness spread through all of them.

The accommodation consisted of a dwelling-house and offices which the officers and non-commissioned officers occupied, and shelters constructed of wood and canvas for the men. All were placed compactly on an elevated site adjacent to a pool which covered about an acre and contained more or less stagnant water. Agricultural drains of muddy water were in touch. The sanitary arrangements were satisfactory except the drinking water, which was bad; the latrines and horse lines were at a reasonable distance. Preventive measures were adopted in the form of cresol spraying throughout, and the use of paraffin oil on breeding places. Everyone, officers and other ranks, had a mosquito net, but this could not be counted on as the midge is so small that it can pass through the mesh. They were plentiful, very small and midge-like, with hairy bodies. They were found on walls and in rubble, but the breeding places must be moist.

The incubation period was from four to seven days. The onset was very sudden, accompanied with severe malaise, headache, and suffusion about the eyes and post-orbital pain. Pain in the lumbar region was generally intense, and pain and cramp in the limbs occurred. Constipation was nearly always present and profuse sweating. The temperature rose quickly to 102.5° or 103°, and on a few occasions to 105°. After twenty-four hours the pyrexia diminished, and at the end of three days fell to normal. The pulse was not correspondingly accelerated—it was seldom above 80; it became soft and weak and the cardiac condition required attention.

The suddenness of the onset was the marked feature. A man to all appearances in normal health was on duty at 9 a.m., and an hour later reported ill with giddiness and inability to carry on. His temperature was 103° F.; other symptoms developed in the course of an hour or two. One night another was found on horseback wandering up and down the road, unable to recall to mind the way he was accustomed to take to reach camp. He was feeling dazed and ill, and his temperature was 103.2°. An hour earlier, feeling all right, he had left head quarters of the regiment, two miles back.

Phlebotomus fever had not previously been prevalent, nor were contacts from outside found. One or two subjects of malaria were on the strength. From dengue the condition is differentiated by the suffused eyes, absence of rash and of secondary rise in the temperature after a few days running normal. In paratyphoid the pyrexia seldom runs so high, and has not the characteristic third-day drop to normal. Severity of the rigor and fall of the temperature in a matter of hours distinguish it from malaria; enlargement of the spleen is also to be remembered.

Most cases were evacuated to hospital. Those remaining in the lines were kept together apart from the uninfected; they were given a purgative and sodium salicylate, phenacetin, or opium for the relief of the pyrexia and aching limbs. Subsequent debility was a marked feature

considering the shortness of the acute stage, but many managed to recover sufficiently to return to light duty after fourteen days.

CLINICAL NOTES ON PHLEBOTOMUS FEVER.

BY

CAPTAIN J. A. DELMEGE, R.A.M.C.,

AND

CAPTAIN C. S. STADDON, R.A.M.C.

PHLEBOTOMUS FEVER occurred in Macedonia as an epidemic which attacked certain units camped in the vicinity of some old ruined buildings.

The *Phlebotomus papatasii* fly was very numerous in the tents and dug-outs, and bites were inflicted both by day and night. Exposed parts were most affected—the backs of the hands, the forearms, especially the flexor surfaces, the ankles, and the face. A small irritable papule was produced; in one case the papules were so numerous as to simulate a definite rash.

It was found impossible to make any accurate observations as to the fly's radius of action, but whether by actual flight, or more probably by conveyance on wagons and limbers, it was certainly not less than 300 yards, or more than 500.

The Incubation Period.—This varied from four to six days, and was marked by a feeling of malaise and irritability of temper.

The *onset* was almost invariably sudden, and was usually accompanied by slight shivering; no definite rigors, however, were observed in any case. A slight degree of nasal catarrh, lasting for the first day or two of the fever, occurred in some.

Symptoms.—Severe headache, either frontal or post-orbital, was invariable; abdominal discomfort — not amounting to pain—backache (very marked in some cases), pains in the limbs, and anorexia usually accompanied it.

Signs.—The face was usually uniformly flushed, but though this flush was in no way typical, it did not in any way suggest the dark, flushed, bloated facies of relapsing fever. The conjunctivae were injected, but the amount of injection varied, being in some cases extremely marked and hardly noticeable in others. It bore no relation to the severity of the infection. The eyeballs were usually tender on palpation. The tongue showed a thick brownish fur on the dorsum, but was clean at the tip and at the edges. The pulse was in many cases slow; rates of 55 and 50 were common, and in one case the rate fell to 40 during both of two attacks.

The *temperature* usually rose suddenly to 103° (105° was the highest noted), remained between 102° and 103° for about twenty-four to thirty-six hours, terminating, in the large majority of cases, by a critical fall, and remaining subnormal for three or four days.

The temperature charts showed three main types, depending on the fall and subsequent course of the temperature curve. In the accompanying charts the whole pyrexial period is not shown.

1. Curve showing a critical fall, or much more rarely a gradual one, on the second, third, or fourth day, and remaining subsequently subnormal or normal. (See Chart 1.)

2. Curve showing a critical fall to normal or subnormal, followed by a further rise, either immediate or after a day or two, the temperature remaining up for one or two days. (See Charts 2 and 3.)

3. Curve showing a critical fall, followed by more than one post-critical rise of temperature occurring at irregular intervals. (See Charts 4 and 5.)

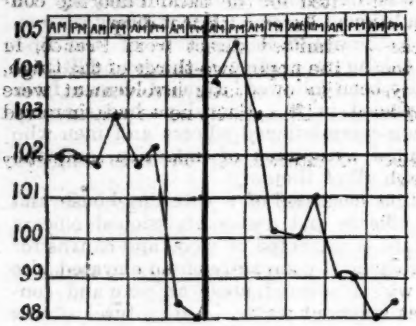

CHART 1.

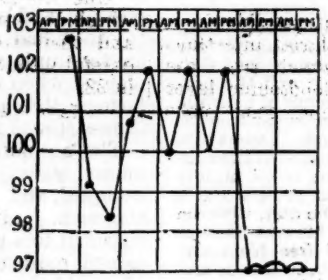

CHART 2.

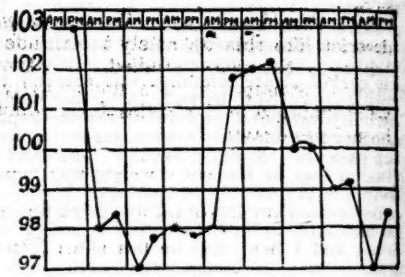

CHART 3.

Course.—The prostration became more and more marked as the pyrexia continued, and by the time it subsided might have become very severe. The headache disappeared with the fall of temperature, but the backache and the pains in the limbs frequently persisted for several days afterwards; in several cases the pain only became marked after the fall in temperature had taken place. The slowness of the pulse often persisted for four or five days after the temperature fell. Appetite returned gradually, but convalescence was slow, and the patient remained debilitated for a week or ten days or even more.

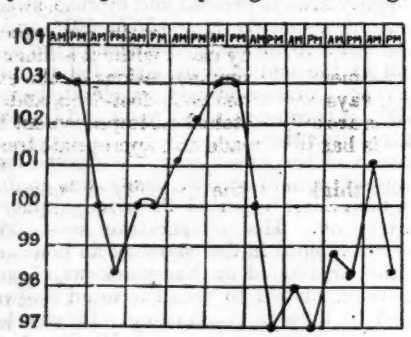

CHART 4.

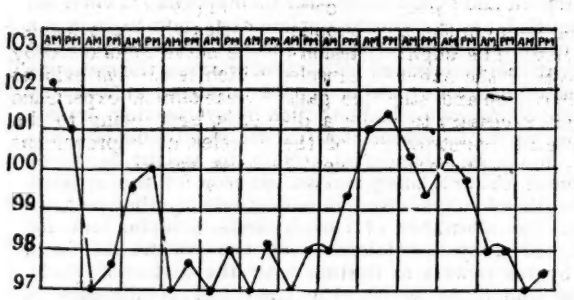

CHART 5.

The *complications* observed were:

Conjunctivitis.—This was quite severe in one case.

Epistaxis.—This occurred in several cases.

Sore Throat.—This, associated with faucial injection, was observed in several cases.

Vomiting.—This was quite marked in one case, and was not due apparently to any outside cause.

Reinfections were comparatively common. They were almost invariably milder; the temperature seldom rose above 100° F. (101.8° F. was the highest noted), and the rise lasted only one or at most two days. The symptoms and subsequent debility were also much less marked, and no complications were noted. No case of more than one reinfection was observed.

The *treatment* adopted presented no points of special interest. Tinct. opii ɱxx at the onset, repeated on the second and third nights and combined with magnesium sulphate 1 oz. daily, was found very efficacious. Aspirin relieved the headache and the pains. Easton's syrup was given during convalescence.

Conclusions.

The following would seem to be the chief clinical features in which the disease, as seen here, differed from the commonly circulated descriptions:

1. The occurrence of definite reinfections.
2. The frequency of post-critical rises of temperature.
3. The great variability in the amount of conjunctival injection.
4. The great preponderance of critical falls of temperature over those falling by lysis.

It is also an interesting fact that no cases were noted amongst the Cypriote muleteers camped in the affected area.

We should add that though it was impossible in a district like this definitely to exclude malarial infections amongst the cases studied, only those which from the clinical standpoint were undoubtedly phlebotomus fever were included in the series from which these conclusions have been drawn.

THE INVOLVEMENT OF THE EXTERNAL AND INTERNAL POPLITEAL NERVES IN LESIONS OF THE SCIATIC NERVE.

By T. E. HAMMOND, F.R.C.S.Eng.,

LATE SURGEON TO ALDER HEY MILITARY ORTHOPAEDIC HOSPITAL, LIVERPOOL.

During the South African war the external popliteal nerve was stated to be involved nine times as frequently as the internal popliteal nerve. In injuries of the sciatic nerve during the present war the proportion is stated to be three to one. Hoffman believed it to be due to the smaller blood supply of the external popliteal; but, on the other hand, this is the smaller nerve. The fact that the internal lies more in line with the femoral vessels and that the external is the more superficial cannot account for the disproportion, as the nerves lie side by side, and bullets pass in all directions.

The external popliteal, corresponding to the musculo-spiral nerve in the arm, supplies muscles which act against gravity. The slightest lesion of the nerve is followed by paresis of the extensor muscles, which is always evident by foot-drop and steppage gait. Great clinical experience is not necessary to make a diagnosis, and, owing to the continual overstretching of the muscles, no improvement follows until proper treatment has been applied.

The internal popliteal, corresponding to the ulnar and median nerves in the arm, supplies the plantar flexors of the ankle, the small muscles of the foot, and sensory fibres to the skin of the heel and sole. The action of these muscles is aided by gravity. In complete division but slight deformity is usually present, and apart from inelasticity in the gait, slight inconvenience is caused; this is shown by the useful movement obtained in complete division of the sciatic after correction of the drop-foot by a suitable boot. In incomplete division slight pes cavus may be present with paresis of the flexor muscles and anaesthesia, trophic changes being usually absent. Voluntary contraction of the flexors produces plantar flexion of the ankle and toes. The paresis is often difficult to observe, unless a careful examination is made, full plantar flexion of the ankle and toes being possible by the action of gravity alone, if the extensors be relaxed. It should be sought for with the patient lying prone and the knee flexed to a right angle, plantar flexion now taking place against the action of gravity. The skin of the sole and heel is not very sensitive, and to excite epicritic sensation in the normal sole slight pressure of the cotton-wool may be necessary. The internal saphenous and the popliteal position of the external saphenous encroach on the sole of the foot and many of the ligaments are supplied by the external popliteal, and as in an incomplete lesion deep pressure sensation is often retained, the greatest care in applying the cotton-wool test is necessary.

In the case of an incomplete lesion of the internal popliteal associated with a complete or incomplete lesion of the external popliteal, the flexor muscles contract with the aid of gravity, and, as they have not to overcome the normal tone of the extensors, their action may appear to be as great as usual.

Careful examination by a competent observer is necessary for the diagnosis of some of these incomplete lesions. The foot from the time of the injury is placed by the action of gravity in the position of plantar flexion, this relaxes the affected muscles and helps their recovery, even if no treatment be applied.

In lesions of the sciatic nerve admitted to Alder Hey from other hospitals, the external popliteal was affected three times as often as the internal. The greater number of the latter were admitted for the painful neuritic condition, or for the combined lesion with foot-drop.

One hundred cases, admitted direct from France, in which the wound was in the upper two-thirds of the thigh, and there was a possibility of sciatic involvement, were carefully examined by me. The sciatic nerve was involved in 22.

In 4 the external and internal portions were completely involved.
In 3 the external was completely and the internal incompletely involved.
In 2 the internal was completely and the external incompletely involved.
In 9 the external and internal were both incompletely involved.
In 3 the external was alone involved.
In 1 the internal was alone involved.

The external popliteal was thus involved in 21 and the internal in 19 cases. In some of the latter diagnosis was only possible after a most careful examination, and in most cases the associated foot-drop alone caused inconvenience; except in the painful neuritic forms, there was a marked tendency for improvement to occur in the incomplete lesions. Incomplete lesions of the external popliteal did not show the same tendency to recover, and with the slightest paresis diagnosis was always evident owing to the inability to maintain dorsiflexion.

Conclusions.

It may therefore be stated that for diagnosis of incomplete lesions of the internal popliteal nerve a most careful examination is necessary, especially if a lesion of the external popliteal be present. In addition, the muscles are naturally placed in the position of relaxation, and recovery follows in many cases without a diagnosis or any special treatment. Incomplete lesions of the external popliteal are always associated with foot-drop, and, as the affected muscles are overstretched, no improvement follows until a diagnosis has been made and appropriate treatment instituted.

I cannot but think that the majority of lesions of the internal popliteal are never diagnosed, while lesions of the external popliteal are scarcely ever missed. During the examination of certain cases which could not pass the necessary tests at a command dépôt thirty-six nerve lesions were discovered by me, in spite of the fact that all cases should have been fit for general service four months after admission; thirty-five were previously undiagnosed lesions of the median and ulnar nerves, while only one was a lesion of the musculo-spiral, and this had been operated upon. Lesions of the median and ulnar nerves do not usually give rise to a deformity of a degree comparable to that present in musculo-spiral lesions. It therefore seems that even in the arm nerve lesions are more likely to be missed by inexperienced observers if marked deformity be absent; this must apply all the more to the leg, where special function of the toes is not required.

At a meeting of the Société de Biologie on March 23rd Professor Richet read a paper on the mechanism of death by haemorrhage. He stated that in a dog bled to 4 per cent. of its weight, respiration was profoundly affected by the position of the head. If it were lowered the animal breathed regularly; when it was raised respiration became asphyxial. He concludes that death by haemorrhage is due to cerebral anaemia.

THE EPIDEMIOLOGY OF MENINGOCOCCAL MENINGITIS, OR CEREBRO-SPINAL FEVER.

By A. M. N. PRINGLE, M.B., C.M.,
M.O.H. IPSWICH.

The prevalence of cerebro-spinal fever is essentially seasonal, as is well illustrated by the fact that in Ipswich, during the three years 1915–1917, 26 cases occurred in the March quarter, 33 in the June quarter, 2 in the September, and 2 in the December quarter. The maximum prevalence of the disease was in the month of March, closely followed by April. The next in order were the months of May, February, and June, but the degree of prevalence in these three months may be judged from the fact that the total number of cases for the three months was equal only to that of the month of March. After June the cases have been sporadic; the only month in which no cases have occurred has been July.

The position, therefore, is that the disease has never been entirely absent from Ipswich during the last three years, but has been most prevalent in February, March, April, May, and June, particularly in March and April. This seasonal prevalence has been characteristic of each of the three years.

Consideration of these facts would appear to establish a prima facie case for the association of the disease with some condition, or conditions, common to the whole year, but most in evidence in the winter and spring.

Without entering into details, we may assume that most would agree that an organism found in one part of the body, morphologically, culturally, and serologically identical with an organism inhabiting another part of the human host was one and the same organism. We are therefore justified in the assumption that a nasopharyngeal coccus and the meningococcus, which are morphologically, culturally, and serologically identical, are one and the same organism. The fact that the meningococcus in the cerebro-spinal system produces the phenomena of meningococcal meningitis, and that in the nasopharynx it produces no obvious symptoms, is quite consistent with this conclusion.

A large number of demonstrations go to prove that the nasopharynx of an individual suffering from meningococcal meningitis contains the meningococcus in the early stages of the disease. Failures to demonstrate the meningococcus in the nasopharynx of cases of meningococcal meningitis may be due to many causes, such as the extreme delicacy of the organism, faulty swabbing, possibly the exhibition of an anaesthetic before the swab is taken, the taking of swabs too late in the disease, and so on.

The practical epidemiological point is that there is sufficient evidence to justify the opinion that in every case of meningococcal meningitis the nasopharyngeal precedes the meningeal infection. If this view be accepted, then the spread of the disease is due to the transference of the meningococcus from one nasopharynx to another.

We may now inquire what evidence exists indicating that the meningococcus is spread from person to person. In this relation I quote the figures of a recent report by the Local Government Board, which epitomizes the work done in this matter by the Board's bacteriologists. They found that amongst 1,881 persons from many different sources and places who had not been in contact with cases of cerebro-spinal fever, no less than 13.5 per cent. harboured in the nasopharynx an organism which was morphologically and culturally identical with the meningococcus, and in the opinion of the Board's bacteriologists was, in fact, the meningococcus. If this statement be correct, even if the proportion given is greatly overstated, it affords definite evidence of a widespread nasopharyngeal meningococcal infection. The number of persons infected in an infected area would, on this basis, in a town of the size of Ipswich, in any one year, be very large, each being capable of transmitting the infection to others.

A normal healthy nasopharynx will rid itself of the meningococcus without treatment, or in spite of it, on the average, in something under a fortnight. An unhealthy nasopharynx, with adenoids, etc., can retain the infection for a longer period. Some individuals retain the infection for prolonged periods and become true carriers. I have known one case out of a limited number which remained infected for over six weeks. Such persons will serve to assist in maintaining the meningococcus in a locality and will help to bridge over the summer and autumn intervals. Naturally, those in this group will be relatively few, so that the numbers infected by them will be few in relation to the total population. Nevertheless, they will assist in maintaining the reservoir.

We are now in a position to go back to the seasonal nature of meningococcal meningitis. Nasopharyngeal infections of all sorts are spread from person to person in the acts of coughing and sneezing, the immediate atmosphere being impregnated with spray or droplets, containing members of the nasopharyngeal flora. Therefore, all nasopharyngeal infections will be most readily spread during the seasons of the year when coughs and colds and other nasopharyngeal and respiratory infections are most prevalent. The spread of infection will be assisted by the closer crowding of the population during these periods of the year and by the closing up of ventilation and the complete ignorance and indifference of the public as to the mode of spread of this group of catarrhal infections.

We should, therefore, expect that meningococcal meningitis, secondary to nasopharyngeal infection, would be most prevalent in February, March, April, and May, which is precisely what does occur, as evidenced by the sudden appearance of cases of the disease in these months.

In my opinion the rise in meningococcal meningitis coincides with an increase in the density of the nasopharyngeal infection, whilst the summer and autumn fall coincides with a corresponding drop. We thus get a vicious circle produced by (1) a rise in the usual winter coughs and colds, a proportion of the sufferers harbouring the meningococcus; (2) a number of people are infected by these, the number varying with the opportunities of infection; (3) these in turn cough on the infection, and thus with an increase of catarrhal infections a constantly increasing number of persons become infected with the nasopharyngeal infection; (4) when the finer weather comes on, coughs and colds diminish rapidly, and so does the meningococcal nasopharyngeal infection.

The question may now be asked, granting all this, Why are there not more cases of meningococcal meningitis? My answer to this is that the invasion of the meninges by the meningococcus is an accident dependent on conditions as yet undetermined. If this view is correct, it is merely a mathematical proposition that the greater the number of individuals involved, granting the possibility of the accident, the greater will be the number of accidents. I believe that the existing evidence tends to show that the height of the meningeal epidemic corresponds to the greatest density of the nasopharyngeal epidemic and that the sporadic cases occurring during the other parts of the year merely indicate the existence of a reservoir of nasopharyngeal meningococcal infection.

If these views are correct, then the present mode of dealing with a few positive contacts of a few cases of meningococcal meningitis is futile.

In support of this view of the epidemiology of the disease is the quite marked independence of individual cases. True, on occasion, more than one member of the same family may be attacked. Thus I have seen three cases in one family and two in another. Nevertheless, the general fact is that the cases are single and independent and occur amongst individuals who have no connexion of any kind with one another. This, in my opinion, is strong evidence of a widespread generalized infection.

A FATAL CASE OF PARATYPHOID B SIMULATING TYPHUS FEVER.

BY
P. S. HICHENS, M.D., F.R.C.P., Temp. Lieut.-Colonel R.A.M.C.(T.F.), AND E. J. BOOME, M.B., D.P.H., Captain R.A.M.C.(T.F.).

The following fatal case of paratyphoid fever due to the *Bacillus paratyphosus* B seems to be worth noting, not only from the extreme severity of the lesions found *post mortem*, but also from the clinical course of the disease.

On admission to this unit the patient presented a clinical appearance almost indistinguishable from an advanced stage of typhus fever. He was in a state of

low muttering delirium with carphology, coma-vigil, and retention of urine; there was a faint purple petechial and macular eruption on the chest and abdomen. Had we not had the advantage of skilled bacteriologists to examine the patient both before admission to this unit, and also while here, the condition would almost certainly have been diagnosed as an advanced stage of typhus fever. Owing to our situation at the front, it has been impossible for us to search the literature and ascertain whether many other such cases have been already recorded. As far as we have been able to learn the number of severely toxic cases of paratyphoid is very small.

The kidney lesions in this case were remarkable, and Hurst in his book, *Medical Diseases of the War*, seems to describe a somewhat analogous case suffering from paratyphoid A, in which death occurred from suppurative nephritis in the fifth week. Death occurred in this case in the third week from what might be called "a pyaemic condition," and in all the abscesses the *Bacillus paratyphosus* B was found.

Captain Lindsay of the 13th Mobile Laboratory discovered the bacillus before the case was admitted to this hospital, and we are grateful to Captain J. Cruickshank, Officer Commanding 18th Mobile Laboratory, for further bacteriological investigations and the help he gave at the necropsy. We are indebted also to Captain A. M. Davie, R.A.M.C.T., for notes on the patient at the onset of his disease in the line, and to Captain Gray, R.A.M.C., for some of the earlier clinical notes.

Condition of Patient in the Line.—The patient had had two doses of antityphoid vaccine in December, 1915, and two doses of the triple vaccine (T.A.B.) in June, 1917. He had served nine months in France, and had reported sick at odd times before with very minor ailments. On September 17th, 1917, when the battalion was in the line, he complained of pains in the stomach and diarrhoea of sudden onset. Next day he complained of pains in the head and legs, with shivering; temperature 101.2°; diarrhoea better. He was sent by the regimental M.O. to the field ambulance as P.U.O., and was detained there for the night. On September 19th he was evacuated to a clearing station, complaining of pains in the head and across the abdomen, with pain also in the muscles of the thigh and calf. On September 20th there was pain and tenderness in the epigastric region, with cramps in the hands and legs, vomiting, rigors, and cough. On September 24th abdominal pain was complained of, the lower abdomen being tender, but not rigid. The patient complained of retention of urine, but passed a small quantity after suprapubic fomentation. From September 25th to 29th the condition was much the same; the urine passed in twenty-four hours varied between 4 and 12 oz. On September 29th *B. paratyphosus* B was found in the blood on culture. The spleen was palpable and the urine smoky. He was transferred to the infectious casualty clearing station.

Condition on Admission.—The patient was semi-comatose, with dusky and livid face. There was retention of urine and the bowels were confined. Epistaxis occurred. After a while there was low muttering delirium and carphology. The abdomen was slightly distended and tender, the spleen readily palpable; there were no typical rose spots, but on the chest a fine petechial eruption with subcuticular mottling in the axillae. Next day the patient was much worse, wildly delirious, and trying to get out of bed. Signs of consolidation were found in the left lung and at the base of the right lung. A simple enema was given with satisfactory result. Ten ounces of bloody urine were drawn off by catheter. The patient died at 5.45 a.m. on September 31st.

Post-mortem Examination.

On the abdomen and front of chest there were a few pale petechial spots.

Left Lung: Adherent all over (old adhesions). Large haemorrhagic infarction in lower lobe; area of infarction with pneumonia in upper lobe. Right Lung: Free from adhesions; lower lobe completely consolidated; early grey hepatization, with red hepatization of contiguous portions of other lobes. There was inflammatory exudate between the lobes.

Ileum congested along whole length, with acute inflammation of mesentery in this area; glands enlarged, congested, and haemorrhagic; Peyer's patches along last three feet of ileum swollen and congested; no ulceration. Large intestine contained fluid faeces; diffuse inflammatory changes along caecum and ascending colon.

Surface of left kidney studded with yellowish-white nodules and in places definite abscesses with fluid pus; on section kidney riddled with abscesses. Similar septic condition of right kidney.

The liver showed cloudy swelling; gall bladder markedly distended. Spleen enlarged and congested; haemorrhagic spots on section. The bladder showed well-marked purulent cystitis. Brain and medulla: Some excess of fluid, but no meningitis.

B. paratyphosus B was grown from urine, kidney abscesses, bladder, and spleen.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

PREVENTION OF NERVE BULBS IN STUMPS.

PAINFUL bulbs on the ends of nerves following amputation are so frequent and troublesome as to cause a very protracted convalescence in a large number of cases. In an article in the BRITISH MEDICAL JOURNAL of August 25th, 1917, I described a method of dealing with nerves which experience has further shown to be valuable in preventing these neuromas.

Recently I had the advantage of seeing a median nerve which had been treated in this way four months previously together with an ulnar nerve which at the amputation had been severed in the ordinary way. The median end was the shape of a pointed pencil, and the ulnar nerve had a large and tender bulb.

It would appear that when a nerve is severed in amputation the axis cylinders grow out in search, as it were, of those of the other severed end. These nerve elements from the central end multiply, enlarge, and get involved in and surrounded by fibrous tissue, which on contracting squeezes and renders tender and painful the sensitive nervous tissue involved in the mass. A bulb may exist and not be painful or tender until this contraction takes place.

My experience tends to show that if the sheath of a nerve is cut and stripped back along its trunk with a piece of gauze between the finger and thumb for about half an inch in the form of a cuff, and then brought forward and tied after the denuded trunk has been severed, the sheath acts as a limiting resisting membrane, and this protrusion of axis cylinders is prevented.

W. A. CHAPPLE, M.D., Ch.B., M.R.C.S., D.P.H.,
Major R.A.M.C.
Pavilion Hospital for Limbless Men,
Brighton.

COINCIDENT INFECTIONS OF GONORRHOEA AND SYPHILIS.

FROM 5 to 10 per cent. of all cases of gonorrhoea subsequently develop syphilis. The infections are acquired simultaneously or within a short period. In an experience during the last twelve months of over 200 cases of double infections I have never seen complications or retardation of cure caused by either mercurial or arsenical preparations, as suggested by Captain Lumb (BRITISH MEDICAL JOURNAL, March 9th, p. 285). The cases were treated with injections of novarsenobillon, either intravenously or subcutaneously, and 1 grain of mercurial cream weekly. Smears for gonococci were taken on admission, and afterwards weekly smears, the first thing in the morning. If the smear was negative and the patient dry for seven days, a urine test was done after prostatic massage. If this test was negative the case was considered cured.

Patients in the syphilis wards gave negative smears sooner than those in the gonorrhoea wards, due, as I concluded, to their having to rest more, owing to their injections and perhaps a greater incentive to get rid of a loathsome combination by inducing them to irrigate thoroughly. Venereal hospitals are a refuge for many slackers and shirkers. Among these 200 cases two of epididymitis occurred during treatment, and another about a month after the completion of antisyphilitic treatment following the passage of a bougie. No cases of prostatitis occurred. The treatment for gonorrhoea was irrigation of the bladder with potassium permanganate and prostatic massage occasionally. No drugs were given, and vaccines only in cases of rheumatism. The patients, except in rare instances, were cured of gonorrhoea before the course of antisyphilitic treatment was completed.

The urethral discharge is sometimes increased following an injection of neosalvarsan, especially in early secondary syphilis with wide generalization of the spirochaete—the class of case in which a rise of temperature and malaise follow a first injection. Any depressing cause will increase the urethral discharge temporarily. In early primary syphilis reactions seldom occur.

A small proportion of cases are either lamed by intramuscular injections of neosalvarsan, or have so much pain as to make the method unsuitable in private practice. The deep subcutaneous method causes less pain and

certainly much less stiffness. It is suitable for all but very thin men. The novarsenobillon is dissolved in a few drops of distilled water, creo-camph. added up to 2 c.cm., and injected immediately. The needle is inserted vertically to the skin over the upper and outer gluteal region to a depth of about three-quarters of an inch. I do not find stovaine solution any help. Only neosalvarsan or its equivalents, neokharsivan, novarsenobillon, or novarsenobenzol, can be used for subcutaneous injections.

JOHN A. WATT,
Warlingham Military Hospital. Captain R.A.M.C.T.

APPENDICITIS IN A FEMORAL HERNIA.

MRS. D., aged 43, had a lump in her right groin for ten years, and had had attacks of "inflammation" in it about twice a year, usually brought on by extra work. The attacks lasted about a week, during which the lump would become larger and painful, and she had pain in the lower part of the belly. The history as to vomiting and constipation was uncertain.

On January 16th, 1918, an attack commenced, and as she gradually became worse her doctor advised her admission to hospital (January 23rd, 1918). The lump was a femoral hernia, large, tense, and tender; her bowels had opened after medicine two days before, and there was no vomiting; pulse 100, temperature 99°.

The sac was found to be tense and full of clear fluid; at the bottom was what was thought to be either a Richter's hernia, or possibly the appendix. After the constriction had been nicked and enlarged four inches of appendix was easily pulled down, the terminal inch being doubled on itself; a cuff was turned up and the four inches of appendix crushed and removed. As the woman was fat and had chronic bronchitis, it was not considered advisable to prolong the operation by removing the rest of the appendix flush with the caecum.

The appendix in its terminal two inches and its mesentery were considerably enlarged and thickened; much of the thickening was not recent; it appeared as if it would have perforated at the bend referred to. Recovery was uneventful.

R. V. DE ACTON REDWOOD, M.R.C.S.
Rhymney Cottage Hospital.

REPLACEMENT AND RESTORATION OF FUNCTION OF THE UTERUS AFTER PROLONGED INVERSION.

ON September 30th, 1917, a Gilbertese married woman, aged about 25, was admitted to Betio Central Hospital, Tarawa, suffering from complete inversion of the uterus. The inversion took place at the birth of her youngest child, now aged 2½ years, and had been present ever since. There were no symptoms, there had never been any haemorrhage, and the only thing that the patient complained of was the presence of the tumour.

Reduction after cleansing was attempted in vain.

The part was washed daily with sanitas lotion, 1 in 100, and two weeks later I was able to reduce the inversion with very little pressure and replace the uterus. A ring pessary and a cotton-wool tampon were inserted. The tampon was removed daily, the patient was douched, and a fresh tampon introduced.

In about two weeks she had a little blood on the tampon one morning. Four weeks later menstruation occurred normally.

The case may be interesting to practitioners because of the apparent rapid restoration of function after such a long period of "rest."

J. G. MCNAUGHTON, M.D., M.R.C.P.Edin.,
S.M.O. Gilbert and Ellice Islands.
Gilbert Islands, Western Pacific.

ERRANT RABBIT BONES.

ON two occasions I have seen at *post-mortem* examination rabbit rib bones on their way through the small intestine to the peritoneal cavity. In one case there were two of these bones passing through, and in the other only one. They had had nothing to do with the cause of death.

W. A. CARLINE.
Lincoln.

Reports of Societies.

SPIROCHAETOSIS ICTEROHAEMORRHAGICA.

AT a meeting of the Section of Medicine of the Royal Society of Medicine held on March 26th, Surg.-General H. D. ROLLESTON, R.N., being in the chair, Colonel Sir BERTRAND DAWSON, K.C.V.O., R.A.M.C., gave a lecture on spirochaetosis icterohaemorrhagica, exhibiting pictures on the epidiascope illustrating the cases and the pathological conditions. (See paper by Dawson, Hume, and Bedson, BRITISH MEDICAL JOURNAL, September 15th, 1917.) After discussing the etiology and symptoms Sir Bertrand Dawson showed notes of cases illustrating various types of the disease, and demonstrating how the brunt of the morbid process did not always fall on the same organs. He considered that the jaundice was caused either (1) by obstruction to the outlet of the common duct in the cases where there was inflammation and swelling of the duodenum and papilla of Vater and no changes within the liver except bile stasis, or (2) by interference with the drainage of bile within the liver, in cases where there was disorganization of the lobules with damage to the cells and intrahepatic ducts. Where there were no definite changes in the liver and no swelling of the duodenum, jaundice was absent. Repeated examinations had shown that jaundice was not due to over-production of bile. There had never been any evidence of blood destruction, and in two cases in which it was tested the blood fragility was normal. Comparing this disease with acute yellow atrophy, the speaker considered that what was styled in the *post-mortem* room "acute yellow atrophy" was the fullest anatomical expression of a destructive process, of which there were several grades, and which might be caused by several agencies, the *Spirochaeta icterohaemorrhagiae* amongst them. The spirochaete was found with difficulty in man, but was abundantly present in the guinea-pig, in the blood of the jaundiced animal, in the liver, and in the kidneys and suprarenals. Spirochaetes were excreted in the urine, faeces, and bile. In the diagnosis of spirochaetosis icterohaemorrhagica the presence of the typical spirochaete taken in conjunction with the clinical manifestations was strong evidence on which a positive conclusion was warranted.

In the course of the discussion Surgeon-General Sir DAVID BRUCE said that no spirochaetes had been found in cases of jaundice in South Africa. There was no proof that spirochaetes had been found in trench fever. None were present if precautions were taken in collecting the urine. He thought that there was not yet sufficient proof to warrant the assumption that the infection in spirochaetosis icterohaemorrhagica took place by the mouth. The same thing had been said of malaria before it was proved otherwise. Infection might occur through the skin.

Surgeon-General ROLLESTON said that probably many cases of "Weil's disease" were spirochaetal jaundice, whilst the splenic enlargement in others might be evidence of enteric jaundice.

HOSPITALS FOR ADVANCED PULMONARY TUBERCULOSIS.

AT a meeting of the Tuberculosis Society on March 25th, at the House of the Royal Society of Medicine, a discussion took place on the need for hospitals for advanced cases of pulmonary consumption.

Dr. HALLIDAY SUTHERLAND, the President, commenting on the recent rise of 12 per cent. in the death-rate from pulmonary tuberculosis in England and Wales, suggested that active measures against tuberculosis were likely to be followed by an immediate rise in the death-rate, because when the services of experts were generally available many deaths now wrongly attributed to bronchitis or to chronic pneumonia would then be ascribed to their real cause—tuberculosis. But there was no adequate provision throughout the country for the treatment of advanced cases. The Departmental Committee on Tuberculosis (1912) recommended as a minimum standard that the combined number of sanatorium and hospital beds should be one bed to every 2,500 of population. He estimated that of all new

cases of pulmonary tuberculosis coming to tuberculosis dispensaries 50 per cent. could be treated at dispensaries, at open-air schools, or at home; 30 per cent. required sanatorium treatment for an average period of six months, and of these latter one-third required a year's subsequent treatment at a farm colony; 20 per cent. would be in the advanced stages; of these, half were living in small overcrowded houses, where the chance of infecting others was very great and comforts were very few; and for these patients tuberculosis hospitals were required. Clinical experience suggested that for every two who died of pulmonary tuberculosis there were three patients needing sanatorium treatment. Applying that formula to Scotland, there were, on a moderate estimate, 7,936 patients in 1915 requiring sanatorium treatment. But actually there were only 2,365 beds available for all cases, while there were 2,645 advanced cases requiring hospital treatment. There was one bed for every 2,010 people, and in 1917 there was one bed for every 1,900 people. In England and Wales there were 41,676 deaths from pulmonary tuberculosis during 1915. In June, 1916, there were 11,893 beds in England, or one bed per 2,973 people. Including Wales, there were 12,523 beds. He estimated that in the two countries there were 62,514 cases requiring sanatorium treatment. But there were 20,838 advanced cases requiring hospital treatment. England needed 50,975 beds, or one bed per 693 of population—more than four times the number available in 1915. Of new beds, over 30,000 were needed in sanatoriums, over 10,000 in farm colonies, and over 9,000 in tuberculosis hospitals. Outside the Poor Law he did not know of more than 600 beds for advanced cases in England and Wales, hence sanatoriums for the most part were filled with advanced cases. The truth of the matter was not the recent unfortunate verdict of the Medical Society of London that sanatoriums had failed, but that sanatoriums so far had never had a chance. A tuberculosis hospital of 20 beds should be created in the vicinity of every tuberculosis dispensary. If that were done to-day, 7,420 beds would be available for advanced cases within easy access of their homes. In addition to hopeless cases these hospitals would admit some patients for observation and others for special treatment. When suitable treatment was offered the people would take advantage of it. Compulsion would be unnecessary, and, indeed, where it had been tried, as in New York, the result was a failure.

Mr. HERBERT WOOLCOMBE (Charity Organization Society) said that the whole subject was one of great urgency, and was about to be considered by the National Association for the Prevention of Consumption.

Dr. F. R. WALTERS (Surrey) thought the President had under-estimated the number of advanced cases, if they were agreed on their definition of an advanced case. Cases could be divided into ambulant and febrile, and many of the febrile cases required hospital treatment.

Sir ROBERT PHILIP said that care must be taken in the definition of an advanced case. There was a stage in the illness beyond which the case was hopeless, and for such patients these hospitals were primarily intended. If any other definition were accepted the ground which should be covered by other institutions would be encroached upon. As regards the failure or success of sanatorium treatment, that was a subject on which members of such a society should be able to express an opinion.

Dr. A. J. SHINNIE (Westminster) said that the Westminster guardians had a special hospital at Hendon, and there was no difficulty in inducing patients to go to it, although it was difficult to persuade them to go to an ordinary Poor Law infirmary.

Dr. J. A. RAEBURN (Battersea) thought that the President had over-estimated the number of advanced cases for whom hospital treatment was required.

Dr. SUTHERLAND, in his reply, said that the estimates he had given were intended to serve as a basis for discussion.

The following motion was then passed unanimously:

> That the Tuberculosis Society is of opinion that no adequate provision exists for the treatment of advanced cases of tuberculosis; that a tuberculosis hospital should be created in relation to every tuberculosis dispensary; that such hospitals should be under the medical control of the tuberculosis officers; and that the Society will welcome any effort on the part of the National Association to bring such hospitals into being.

Reviews.

EDINBURGH SURGERY BEFORE LISTER.

COMING so soon after Sir Rickman Godlee's life of Lord Lister, Mr. MILES's pleasantly written account of *The Edinburgh School of Surgery before Lister*[1] is most appropriately timed. Mr. Miles evidently enjoyed his task, and carries the reader easily from the first pages with the weird spelling of the Barber-Surgeons' petition in the sixteenth century to Lister's appreciation of his father-in-law and immediate predecessor, James Syme. The first deacon of the barber-surgeons was Gilbert Prymross, chirurgeon to James VI and ancestor of Lord Rosebery, Hon. F.R.C.S.Eng. and Ed. This guild, while not advancing surgery directly, created opportunities for practical anatomy by obtaining from the town council in 1505 the grant of "ane condempnit man after he be deid, to make anatomea of," though there is no evidence of a regular course of instruction in this subject till the end of the seventeenth century. The surgeons and barbers parted company in 1722, the barbers lingering on till 1892. The period of the Monros began in 1720 with the appointment to the chair of anatomy at the early age of 22 of Alexander, whose just fame has obscured his father's claim to grateful memory for his efforts in stimulating the authorities to organize a complete system of medical education within the university and the institution of the Faculty of Medicine in 1725. The Royal Infirmary, opened in 1741, arose out of the amalgamation of the Physicians' Hospital (1729) with the Surgeons' Hospital (1736), and for years contained the only public bath in the city. During the first half of the eighteenth century the surgeons were not specialists, and during this period of the practitioner surgeons the only names that stand out are those of John Bennet and Alexander Wood. Sketches of them are given, interesting rather on account of their eccentric and convivial characters than for their professional and original eminence. The rise of the Edinburgh school of surgery is traced from its father, Benjamin Bell, who was an ancestor of Joseph Bell, the last of his race and the reputed prototype of Sherlock Holmes, and is followed by chapters on the systematic and clinical professorships which contain many attractive biographies. The lives of Lister and Syme, with the story of their friendship, rivalry, quarrel, and reconciliation, are especially interesting. In conclusion, though what is easy to read is rarely so easily written, we may express the hope that when the physicians of this great school are described, as they should be, in a companion volume in this series, the same success may be attained.

OPERATION AND AFTER.

MR. W. I. DE C. WHEELER'S little handbook of *Operative Surgery*[2] has quickly reached its third edition; the best evidence that it meets a want. Probably, as Sir Alfred Keogh says in his foreword, a great number of young men called upon to take the responsibility of major operations without much experience, appreciate the possession of a small book that just fills a corner in the kitbag. As a matter of fact Mr. Wheeler has tried to hit two birds with one shot: to offer guidance to the senior student in his first course in operative surgery on the cadaver, and at the same time to provide an easy reference aid for the young surgeon at the front. Considered academically, it is to be feared that the author has but winged his birds; there is not enough "spread" in 364 pages. In those surgical centres near the front where the energetic junior staff fill in their spare time with operative surgery classes—and there are such—this is just the book to have.

A great merit of Mr. ALAN H. TODD'S book on *Surgical After-Treatment*,[3] now in its second edition, is that it is cheap, and thus accessible to the house-surgeons, students,

[1] *The Edinburgh School of Surgery before Lister.* By Alexander Miles, Surgeon to the Royal Infirmary, Edinburgh. The Edinburgh Medical Series. London: A. and C. Black. 1918. (Pp. 220; 8 page illustrations. 5s.)

[2] *A Handbook of Operative Surgery.* By William Ireland de C. Wheeler, Lieut.-Colonel R.A.M.C. Third edition. London: Baillière, Tindall, and Cox. 1918. (Cr. 8vo, pp. 364; 226 figures. 10s 6d. net.)

[3] *A Practical Handbook of Surgical After-Treatment.* By Alan H. Todd, M.S., F.R.C.S. London: Edward Arnold. 1917. (Cr. 8vo, pp. 236; 36 figures. 4s. 6d. net.)

and nurses for whom it is primarily intended. It is indexed, and the information it contains is therefore available at the moment it is wanted. Probably the author will modify some of the views he expresses when he is a little further away from a hospital, but with the exception of some dicta as to secondary haemorrhage on p. 54—which, to say the least, are obscure in their orthodoxy—the advice given is generally safe. If every patient who has an injection of salvarsan is to wear an anterior splint for twenty-four hours, the venereal clinics will not be popular. It is a useful little book.

BIOLOGICAL ASPECTS OF WARFARE.

FROM the biological aspect the combative instinct is a universal and normal attribute, and its evolution chiefly depends on three factors—the reproductive instinct, the search for animal food, and intertribal warfare. Carnivorism makes for ferocity, and man, the arch-slaughterer, according to DR. CAMPBELL in his book on *The Biological Aspects of Warfare*,[4] shares with the tiger the two opposed dispositions of combative destruction for his victims and tender altruism for his offspring. But cruelty, the basest of all vices, is not seen among the subhuman animals—even a cat playing with a mouse—who are unconscious of the sufferings of others; to speak of a cruel man as "brutal" is therefore unjust to the brutes. Dr. Campbell's argument is that when the arboreal life of the forest was given up, the conditions entailed by a hunting career brought about the evolution of the pre-human ape into man, and the resulting intertribal battles further stimulated his mental powers and led to the survival of the fittest. But here Dr. Campbell draws a contrast with modern wars, in which the losses on the two sides are approximately the same and the best physical types more or less equally eliminated, while the individual is benefited to some extent by education and discipline, though as a whole the influence is dysgenic by promoting inferior physical types. He follows Herbert Spencer in regarding the exercise of might as legitimate within certain checks or limits which increase with the growth of commercial life. But though it might have been anticipated that these restraints to might-sanction would by now have spread widely, the present war has witnessed the abandonment of moral restraint and reversion to the primal sanction of might by one group of belligerents. The influence of war for good, in stimulating a nation to enormous efforts of production, must be admitted; but it is much to be desired that a similar outburst of energy to wage war on the hygienic and economic evils in our midst in times of peace could also be evoked.

Struggles and powerful stimuli are essential for development, but how in the future, without recourse to war, the degenerating effects of luxury can be counteracted is a great social problem. As means to prevent war, attention is drawn to democratic government and all-round free trade; the latter may now seem the dream of a visionary, but dreams have come true. Dr. Campbell is a stimulating writer, and as his essays are never dull the two short papers on the factors determining man's evolution from the ape and on claustrophobia, bound up in this volume, may be recommended to the usual thoughtful reader.

TROPICAL LABORATORY WORK.

THE scope of the fourth edition of *Laboratory Studies in Tropical Medicine*[5] by Drs. DANIELS and NEWHAM is explained in the preface. The authors have tried as far as possible to bring the book up to date, and to incorporate any new methods which have been proved to be sound and of general utility. They point out that the war has brought into contact with problems of tropical medicine many who had not previously given any attention to them; it is hoped that the book will help to tide some of those over their difficulties. The unfortunate thing about so many of these new workers is that they will not take the trouble to consult the literature, and in many instances rush into print with what appears to them to be something entirely new, whereas it probably saw the light of day a good many years ago. It is sincerely to be hoped that any in this category will read the above book and inwardly digest it. A criticism which must be made is that the part of the book dealing with protozoa in the faeces is not full enough, more especially in view of the great attention lately given to this branch by so many workers. No mention is made, for example, of Wenyon and O'Connor's *E. nana*, nor of the cyst of the small species of *E. histolytica*, so difficult to tell from the cyst of the former. The occurrence of coccidia in human faeces might also have been dealt with in more detail. However, space must be considered, especially in these days, and the authors have probably hesitated to expand the work. The book is a very useful one, and will help those for whom it is intended in every way.

[4] *The Biological Aspects of Warfare.* By Harry Campbell, M.D., F.R.C.P. Reprinted from the *Lancet*. London: Baillière, Tindall, and Cox. 1918. (Demy 8vo, pp. 44. 1s. net.)

[5] *Laboratory Studies in Tropical Medicine.* By C. W. Daniels, M.B., F.R.C.P., and H. B. Newham, M.D., M.R.C.P. Fourth edition, thoroughly revised, with new and additional illustrations. London: John Bale, Sons, and Danielsson, Limited. 1918. (Demy 8vo, pp. xv + 560; 164 figures, 6 plates. 21s. net.)

NOTES ON BOOKS.

DR. E. W. G. MASTERMAN, in his little book *The Deliverance of Jerusalem*,[6] shows the intimate acquaintance with the city to be expected of one who has lived there on and off for twenty years, and a knowledge of the topography and archaeology of the holy land which becomes the Honorary General Secretary of the Palestine Exploration Fund in that country. His description of the plain of Philistia and its coastal cities, of the inland mountains, among which Jerusalem stands some 2,450 feet above the sea, and of the deep valley of the Jordan, renders the military operations easy of comprehension. As to the future of Palestine he writes cautiously. Syrian Moslems formed about three-fourths of the relatively small population before the war. The immediate needs are a settled and just government, an efficient sanitary service, and capital to restore agricultural prosperity and at the same time to check malaria, by which many districts are scourged. The book contains a map and a number of excellent illustrations.

The Belgian Hospital at La Panne is well known to all the world. There is perhaps no better method for those at home to get an idea of the work at a forward operating centre, of the opportunities for scientific investigation of war problems, or of the good use to which charitable funds may be put, than perusal of the first fasciculus of the *Publications by the Staff of the Ambulance de "L'Océan"*[7] under the editorship of the director Dr. DEPAGE. The first 65 pages, by the editor, are devoted to a description of the hospital and all its internal arrangements; not the least interesting part being the account of the "Institut 'Marie Depage'" or group of buildings devoted to research. Dr. Debaisieux gives a good summary of the treatment of wounds, particularly by the Carrel method, and this is followed by an article on secondary suture of wounds. Cranio-cephalic injuries are dealt with by Dr. Janssen from the points of view both of morbid anatomy and clinical practice. Dr. Rubbrecht follows with a contribution on the treatment of fractures of the jaws; Dr. Dustin with one upon the neurological service. The remaining papers are the outcome of research work done in the laboratories, the results of which have already been incorporated in the daily practice of all the allied medical services.

The second edition of JELLIFFE and WHITE'S *Diseases of the Nervous System*[8] aims at providing for the advanced student and for the practitioner of medicine a textbook of neurology and psychiatry. It is divided into three parts: The first deals with the physico-chemical systems of the body—namely, the vegetative or visceral system and the "endocrinopathies" or disorders due to disturbances of the ductless glands. The second part is given to sensorimotor neurology, or disorders of the nervous system generally. Part three, some two hundred pages in length, deals with disorders of the psychical or symbolic systems—neuroses, psychoneuroses, and psychoses—ending up with an account of "characterological defect groups." This extremely up-to-date textbook is full of facts and figures and is well illustrated. It is not food for babes, and should appeal mainly to the expert in nervous disorders.

[6] *The Deliverance of Jerusalem.* By E. W. G. Masterman, M.D., F.R.C.S. London: Hodder and Stoughton. 1918. (Demy 8vo, pp. 51. 1s. net.)

[7] *Ambulance de "L'Océan" La Panne.* Fasc. I. Paris: Masson et Cie. London: H. K. Lewis and Co., Ltd. 1918. (Roy. 8vo, pp. 303. 14s. net. Two numbers annually; subscription 25s. net, post free.)

[8] *Diseases of the Nervous System.* By Smith Ely Jelliffe, M.D., Ph.D., and William A. White, M.D. Second edition. Philadelphia and New York: Lea and Febiger. 1917. (Med. 8vo, pp. xix + 938; 424 figures. 11 plates.)

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MEDICAL WAR LITERATURE.

Is it too much to say that France is winning again the place she has held and lost more than once as the spiritual and intellectual leader of the nations? Partly from love of peace, partly from an easy tolerance of ways she neither understood nor admired, she had submitted even more completely perhaps than this country to the miasm of German propaganda. German agents insinuated themselves into her trade and commerce, and were setting up a claim to lead her in literature and art. German intellectuals, as they have now admitted, aimed at bringing the thought and art of other nations into subjection, as their rulers aimed at a world hegemony which would enable them to compel all other peoples to accept their Kultur and their political control. The response of the French—some politicians apart—to the intense stimulus of war has excited the unfeigned admiration of those who believed in the spirit of the race and the astonishment of those who thought her decadent. We have drawn inspiration from her high spirit when, in 1914, she was, as it seemed, beaten almost to her knees before the Marne. We have sought to imitate her constancy during four weary winters, and to-day we can understand the courage with which she is facing the fresh turn of ill fortune she is sharing with us. The rebound of the French mind, when the weight of suspense was removed and the worst was known, has shown itself in many ways and not least in the remarkable achievements of some of her imaginative writers, not a few of whom have been discovered within the last three or four years. There have been some remarkable English and Canadian books, but no such efflorescence as in France. In the domain of science Germany has been seeking for a generation to impose herself as the arbiter of reputations and the source to which every one must go who desired to understand the progress of science. Without seeking to belittle the contributions Germany has made to science, it may yet fairly be said that she relied far more on establishing herself as a kind of court of appeal, and one of her chief instruments was the laborious collection and lavish publication of abstracts and the compilation of large and costly works of reference. Left to her own resources, as she has been more or less during the last four years, she has failed to maintain her claim to supremacy in science. Systematic search through German medical publications has yielded very little worthy of reproduction.

In clinical medicine and surgery France has undoubtedly taken a leading place, and on more than one occasion recently we have heard the reproach that Great Britain has been outdistanced by her in the production of medical writings relating to the war. The accusation thus bluntly stated is unpalatable, but it contains a certain element of truth. So far as it concerns the bulk and value of the work done in the scientific investigation of the problems newly raised or raised anew by the war, it is not to be accepted. The researches conducted, mainly under the inspiration of the Medical Research Committee, into the etiology and prevention of the typhoid fevers, the dysenteries, and cerebro-spinal fever, are not only of present application, but are permanent acquisitions; so, too, is the work done with regard to disorders of the heart, and in orthopaedics. We may also point with well-founded satisfaction to the way in which the many hygienic problems arising in connexion with munition workers have been tackled under the direction of the committee appointed for this purpose. The contributions made by British surgeons to the prevention and treatment of wound infections can also bear comparison with anything done in France; but in the investigation of the nature and treatment of the psychoneuroses of war we have learnt nearly all that is new from France, and the lesson does not seem yet to be thoroughly understood.

The reproach against this country, that it has been backward in the production of medical literature bearing on the war, finds most of its justification in the failure of English publishers to issue books in which men having recent experience of war conditions summarize the best opinion for the use of medical officers in daily contact with the sick and wounded, and the new problems they present. Some excellent books of the kind have been published by British writers, but the total output has not been large. The Oxford Press made a good beginning, but its effort seems to have died away; the Cambridge Press has done little or nothing; and the London University Press has found no better means of meeting the demand for something like a war library than to issue translations of the set of original handbooks published by Masson in Paris (Collection Horizon). This is a well-deserved compliment, but judging by the very high standard of many of the clinical papers on military medicine and surgery published in the English medical periodicals, native writers competent to deal with almost the whole range of subjects could with a little encouragement from the army authorities and the display of a little more energy by publishers easily have been found.

Probably no one not actually concerned with the conduct of medical periodicals appreciates the difficulties under which they are being carried on. The shortage of paper is one of the chief: in the imposition of restrictions on the amount of paper that may be used there has been no attempt at discrimination. So far as we have been able to observe there has been no very noticeable diminution in the bulk of the principal German medical periodicals. A good many of the smaller French medical periodicals stopped publication when the war broke out and many of these have not reappeared, but those which have been continued show no appreciable diminution in size, and as witness to the vitality of French medical thought the reduction in numbers has perhaps been rather an advantage. Our rulers seem to have given no thought to the need for allowing the medical press to present British work in clinical and scientific medicine in a way adequately to show its excellence to observers and practitioners in our own and other countries.

NEURASTHENIC PENSIONERS.

BREAKDOWN of the nervous system, due to the effect on certain temperaments of the strain of active war conditions, may manifest itself in several different ways, and there seems some danger of confusion of ideas as to the proper method of treating such cases in their various forms and stages. No quite satisfactory general term has been found to apply to them. The speech of the Minister of Pensions at Worcester dealt with pensioners who were spoken of

as "neurasthenic," and the term may be used here, although it is not wholly satisfactory.

Professor Elliot Smith, in a valuable letter to the *Times* of March 22nd, stated that as the outcome of a series of informal conferences at the War Office it was unanimously agreed "that neurasthenic patients should not be mixed with other patients, but should be sent to large hospitals specially set apart for the expert treatment of nervous and mental ailments." Sir Alfred Keogh adopted the recommendations of this informal conference of specialists representing all parts of the country, and they are now being put into practice.

Professor Elliot Smith fortifies his own opinion by reference to the view expressed by Colonel Aldren Turner in his preface to the translation of Roussy and Lhermitte's *Psychoneuroses of War*. "There would appear," he said, "to be general agreement upon the value of the segregation of soldiers suffering from the psychoneuroses, and three years' experience has justified this principle. But it is essential that these patients when segregated should be under the care and treatment of medical officers skilled in the special methods of treatment, and that an 'atmosphere of cure' should pervade the special hospital. . . . The chief criticism raised," he added, "against segregation is that the patients imitate each other. . . . Such is not the general experience, and the authors [Roussy and Lhermitte] confirm what has been observed in this country, that evidence of direct 'contagion' of psychoneurotic symptoms from one group of patients to another is quite exceptional." The view expressed by Roussy and Lhermitte in their book is that the psychoneuroses of war, being disturbances based upon a psychical foundation, yield to rational persuasive psychotherapy, which is defined by Brissaud as consisting "of the employment of means destined to demonstrate to the patient his will power and to train what is left of it in the best possible manner." The war having increased the number of these cases and affected their form it is more than ever desirable to apply energetic and rapid treatment, so that the men may be restored to usefulness. In France such patients are treated in neurological or neuropsychiatric centres. The plan has given excellent results, and "rendered great service both to the patients themselves and to the community." Almost all these cases, they assert, are curable.

Segregation, Professor Elliot Smith points out, was deliberately adopted by our own War Office because such a policy as Mr. Hodge is now talking of adopting in the case of pensioners had failed. Widespread experience, Professor Elliot Smith states, has proved "that when patients suffering from the minor mental effects due to war conditions are mixed in general hospitals with other patients, the manifestations of their symptoms, their eccentricities of conduct and behaviour, make them objects of morbid curiosity to their more normal fellow-patients." The consciousness of this, he says, is a serious addition to their troubles and does an incredible amount of harm. In a special hospital, where wise and sympathetic physicians treat neurasthenic patients with skill and insight, there will always be a large proportion of the patients who are in various stages of recovery. Having recently been through the phases of the illness which the newer patients present, they understand their condition and can give them sympathetic help instead of offensive curiosity or misplaced joviality. From the moment of their entry into a special hospital new patients see with their own eyes and learn from their fellows that such troubles as they are suffering from are really curable. And this "curative atmosphere" becomes one of the most valuable therapeutic agents in restoring these men to a normal condition of mind.

To this Sir Robert Armstrong-Jones, Drs. Caiger and Fox, and Sir George Savage have replied that, while segregation of soldiers suffering from shell shock or neurasthenia may be desirable, it is impracticable for pensioners, most of whom have already been for a long time in hospitals and are now free to choose for themselves. The segregation of pensioners in the later stages of convalescence is condemned. Such men, it is argued, should be treated in village centres, where they would mix with men suffering from all kinds of curable disablement (physical, nervous, and mental) during the convalescent period following discharge from the army. In such centres they would be in healthful and encouraging surroundings, working in congenial occupations, and, if possible, training in the open air. If we could get our terms properly defined it would probably turn out that there was no real conflict of opinion. The point at which the Ministry of Pensions seems to be going wrong is in making the assumption, which appears to underlie its methods, that because a man has been for a long time in hospitals and has been discharged from the army he is incapable of being benefited by the direct method of skilled treatment, which has been so brilliantly worked out in France, and applied with so much success in military neurological centres in this country, as was described by Major Hurst and Dr. Fearnsides during a discussion at the Royal Society of Medicine recently reported in our columns (p. 345). We agree with Professor Elliot Smith that the Pensions Minister "might take a leaf out of the War Office's policy and see that the pensioners obtain the efficient and sympathetic treatment which is being provided by the special neurological hospitals of the Army Medical Service."

THE APPEAL TO MEDICAL MEN BY THE MINISTRY OF NATIONAL SERVICE.

LAST week, at the request of the Ministry of National Service, we published an appeal to medical men who had served with temporary commissions in the R.A.M.C., to volunteer to serve again. The response to the appeal has, we understand, not been unsatisfactory, and has been particularly good from Scotland. We have no information as to Ireland. The appeal is renewed this week, and it is hoped that among those who respond may be a considerable number of medical men with operating experience. We were unable last week to give any specific information as to the conditions of service volunteers were asked to accept. Those to whom telegraphic communications were sent have been informed, as have also the Local Medical War Committees, that the Ministry of National Service has undertaken that the case of any doctor now responding to the appeal, who may desire on personal grounds to return home, or whose presence at home becomes greatly needed to meet civil requirements, shall be reviewed by direction of the Ministry at the close of the present crisis, or in any case not later than six months from the date of joining, with a view to his being released, unless the Ministry, after considering the military and civil necessities at the time in consultation with the Statutory Professional Committee, decides that this is impossible from a military point of view. The hesitation in giving a more definite undertaking may be attributed partly to the uncertainties of the future, and partly to the intention of the War Cabinet to raise the age limit for military service. The Prime Minister, in a statement issued last Saturday, said that "in addition to the

action taken to meet the immediate needs of the moment, it will be necessary to bring into operation certain measures which have long been in contemplation. It is clear," he continued, "that, whatever may happen in this battle, the country must be prepared for further sacrifices to ensure final victory," and he added that the necessary plans had been carefully prepared and would be announced when Parliament meets. The reference is assumed to be to the intention to raise the age limit. Parliament meets on April 9th, and it is expected that on the following day the Minister of National Service will introduce a bill to raise the age limit to 50 and to deal drastically with existing exemptions. The bill will probably become law without much delay, and it is to be noted that the attitude of the Ministry of National Service towards medical men is likely to be materially modified so soon as the Government plans are made public. It would only be reasonable that the Ministry should in the future give special consideration to the desires of those medical men who now come forward to resume commissions previously relinquished. It will be remembered that as long ago as June, 1916, the War Office announced its readiness to give commissions in the R.A.M.C. to medical men between 45 and 55 willing to undertake whole-time general service in the United Kingdom. The offer was then made owing to the great demands upon the Army Medical Service. These demands had not notably diminished before the recent reverse on the Western front, and the losses in medical personnel which have been sustained and the large number of wounded who require treatment make the demand still more urgent to-day. As was then pointed out, every senior man who offers himself for whole-time general service in the United Kingdom will set free one younger medical officer now employed in this country to serve abroad.

THE MEDICAL SERVICES DURING THE RETREAT.

IT is now certain, as was generally supposed, that a very considerable proportion of the prisoners claimed to have been taken by the enemy in the early part of the present offensive were wounded men who had to be left behind on the field of battle. Military considerations made it a matter of extreme difficulty to collect and evacuate casualties during rapid retirement over a wide area. The losses to the R.A.M.C., both in personnel and in stores, must have been heavy, though there is reason for believing that the staffs of the advanced casualty clearing stations which had to be evacuated were got back in safety. Some of these units were able to close up fairly early, but many did not evacuate until the last moment; indeed, until they were practically in the firing line. So far as possible, the sisters were sent back first, then the patients, and the personnel last of all. The difficulties of arranging for ambulance trains and other transport on a large scale during a period of congested traffic must have thrown a very heavy strain upon the administrative medical officers, for in such confused and changing circumstances the exact moment when evacuation should take place is obviously a decision of extreme responsibility. As might be expected, the difficulties in a number of clearing stations were increased by the presence of patients and personnel from more advanced medical units which had been evacuated by road somewhat earlier in the retirement. Nevertheless, we believe that not only these patients but those in attendance on them were all taken back to safety, and the various units are already in course of re-formation behind the present battle line. A great deal of hospital equipment and medical stores of every kind must inevitably have been lost, but this is easier to replace than trained personnel. All accounts agree as to the splendid behaviour of the sisters and nurses of the evacuated units, many of whom lost everything they possessed, and were for a time in great danger. As for the wounded men who have been streaming down to the bases and across the Channel, we learn from competent observers that they have kept throughout in remarkably good spirits. Taking them as a whole, the cases seem to have been on the light side. A good many patients evacuated during the first few days were suffering from the effects of gas.

ACUTE POLIOMYELITIS AND STREPTOCOCCI.

THERE are two distinct views as to the significance of certain streptococci cultivated from the nervous tissues of cases of acute poliomyelitis. Rosenow, Mathers, and others regard them as causally related to the disease, and even related to Flexner and Noguchi's globoid bodies, while Bull, Kolmer, and others look on them as secondary invaders and devoid of any etiological significance. The question has important bearings on the prophylaxis and treatment of acute poliomyelitis. The treatment of the disease by the injection of serum from convalescents has been shown to be effective, but much more success in the production of antibodies against the poliomyelitis virus has been claimed for these streptococci, and the serum of a horse (Rosenow's antipoliomyelitic serum) immunized by these streptococci has been stated to possess neutralizing, protective, and therapeutic properties in human poliomyelitis. Amoss and Eberson[1] of the Rockefeller Institute for Medical Research have experimentally investigated the power of Rosenow's serum to prevent poliomyelitis in monkeys subsequently injected with the virus of poliomyelitis, and have compared it with the known power of the injection of the blood serum of convalescents from the disease to produce this protection. They have not found any evidence that Rosenow's serum is effective therapeutically in monkeys, or that it possesses any antibodies of the same nature as those present in the blood of monkeys or human beings convalescent from the disease.

CULTIVATION OF TUBERCLE BACILLI FROM THE BLOOD.

IN spite of the large amount written on the presence of tubercle bacilli in the blood there is little information based on sound investigation, and the incidence of bacillaemia has been been variously estimated. In 1909 Rosenberger excited considerable incredulity by finding bacilli in the blood of 100 per cent. of 49 cases, and later of 300 cases, by staining the centrifugalized sediment from citrated blood; and subsequently Kurashige found tubercle bacilli in the blood of apparently healthy people. These improbable results were later explained by the frequent presence of acid-fast bacilli in distilled water and by the production of artefacts resembling acid-fast bacilli in the staining of films when the antiformin method is employed. Fallacies have also arisen in connexion with the more reliable inoculation test of guinea-pigs, namely, confusion between tuberculous and non-tuberculous lesions. After allowing for probable errors, Miss Mildred C. Clough,[2] of the Johns Hopkins Hospital, estimates, on the basis of the inoculation test, that in generalized tuberculosis tubercle bacilli have been found in the blood in 66 per cent. of cases, and only in 7 per cent. of other forms of tuberculous infection. Suitable cultural methods would probably give positive results more promptly and more regularly than animal inoculations, and to this question of technique Miss Clough has paid much attention. Up to the present the only positive blood culture was that reported by Faber in a case of generalized tuberculosis. By means of blood cultures Miss Clough has now obtained positive results in five out of seven cases of generalized tuberculosis, and found blood cultures negative in nine cases of other forms of tuberculosis, guinea-pig inoculations in four of these cases being also negative. In the pleuritic fluid in one case, and in the cerebro-spinal fluid in seven, smears were

[1] H. L. Amoss and F. Eberson, *Journ. Exper. Med.*, Baltimore, 1918, xxvii, 309-317.
[2] M. C. Clough, *Amer. Rev. Tuberculosis*, Baltimore, 1917, i, 598-621.

negative, while cultures were positive. Cultures are therefore valuable in the diagnosis of generalized tuberculosis, in the study of bacillaemia in other forms of tuberculosis, and in the examination of spinal, pleuritic, peritoneal, and arthritic fluids when smears do not show tubercle bacilli.

MEDICAL TERMS IN THE NEW ENGLISH DICTIONARY.

THE first word in the new section[1] of the *Oxford English Dictionary* had at one time a definite medical significance, an obsolete meaning of supple being "to soften or mollify a wound or swelling by applying an unguent, a fomentation, etc." A quotation (1579) from a work by Langham illustrates this former meaning: "Apply them to supple, mollifie, ripen, and dissolve all kindes of tumours, hot or cold." A more familiar term is *suppository*, from Lat. *supponere*; it has an illustrative quotation from Lanfranc's *Chirurgerie*, of about the year 1400; and in 1583 it was used by Melbancke figuratively (!) in *Philotimus* in the words, "It is not my purginge pilles . . . but Cornelius his swete suppositorye, that must minister you physicke." A large group of medical terms begin with *supra-*, such as supraclavicular, supraorbital, suprarenal, suprascapular, and supraspinatus. Under suppuration there is a full selection of illustrations, the earliest being from Copland's *Galyen* of the year 1541. Mr. Onions, who edits the present part of the *Dictionary*, deals most interestingly with the word "surgeon." It is used in three senses. The first is also the widest, for it includes one who practises the art of healing by manual operation (the strictly etymological significance), a practitioner who treats wounds, fractures, deformities, or disorders by surgical means; in early use often more widely, a medical man, a doctor; now specially, one who holds a licence or diploma from the Royal College of Surgeons or any other body legally qualifying him to practise in surgery. The second meaning is that of a medical officer in the army or the navy; and the third is the figurative—for example, "I am the Lorde thy surgione," from Coverdale's *Bible* (Exodus). Another word whose older medical meanings are interesting is "sweat"; at first it signified the life blood, and, later, by a curious series of changes came to be one of the secretions of the skin.

ARTERIO-SCLEROSIS.

ONE of the many pitfalls which beset the path of the vital statistician is illustrated by what has happened with regard to the attribution of a greatly increased number of deaths to arterio-sclerosis since the term was first used in the Registrar-General's tables in 1911. The deaths so returned grew continuously from 3,675 in 1911 to 8,012 in 1916. As Dr. Stevenson, in his review of the statistics of the year, observes, it is impossible to suppose that the disease can have in reality showed any corresponding increase of fatality during so short a period as six years. When the figures are analysed further the coincidence becomes more striking; if the deaths of 1911 be taken at 1,000, then those of the five succeeding years were respectively 1,388, 1,769, 2,010, 2,174, and 2,180. The chief growth, therefore, occurred in the period 1911–1914. The frequency with which the condition occurred as a cause of illness and death had by 1912 aroused so much professional interest that in that year the Local Government Board published the first of a series of reports upon the subject by Professor F. W. Andrewes, F.R.S. Another cause which it is thought may have contributed to the result was the issue by the Registrar-General in the same year of suggestions to medical practitioners in regard to certifications, in the course of which the inadequacy of "old age" as a form of death certification in those cases in which the disease causing death could be stated was pointed out. The deaths attributed to old age declined considerably in subsequent years. In 1911 they constituted 346 per 1,000 total male deaths at ages over 75; in 1916 they constituted 267. It is thought probable that in many cases the change was brought about by mention of that disease of old age which at the time was attracting so much attention. The surmise is supported by the fact that the growth, from 1911 to 1916, in mortality attributed to arterio-sclerosis was greatest in old age, increasing with each quinquennium from 55 to 60 onwards. Of the deaths attributed to arterio-sclerosis only about 3 per cent. occurred under 50 years of age and 40 per cent. under 70. The restriction to old age applied a good deal more to females than to males, 67.6 per cent. of all the deaths of females occurring after 70 years of age, as against 55.5 of males. This was to be expected in view of the fact that the proportion of women living at these ages was very much greater than that of men. Further analysis of the statistics showed that excess of male mortality was greatest at from 55 to 70 years, and thereafter diminished progressively. It does not appear at present possible to carry the matter much further, for a very large number of deaths are still attributed to cerebral haemorrhage and apoplexy, and a certain number to cerebral atheroma. Dr. Stevenson points out that until 1901 nearly all deaths from lesions of the cerebral arteries were grouped together under the heading "apoplexy"; this heading was first subdivided into "cerebral haemorrhage, cerebral embolism," and "apoplexy, hemiplegia," 55 per cent. of the deaths being attributed to the latter heading; by 1916 the proportion had fallen to 25 per cent. In commenting on this, Dr. Stevenson observes that twenty years ago it was customary in such cases to certify the condition, apoplexy or paralysis, resulting from the cerebral haemorrhage; then the matter was traced one step further back to the vascular lesion; and now another change is in progress by which the cause of the cerebral haemorrhage is recorded and the death is therefore allocated to arterio-sclerosis. He thinks that a further stage of the same process may possibly even now be transferring some of these deaths to Bright's disease in so far as it is regarded as causing arterio-sclerosis, while a still further stage would transfer them to the toxin (lead, gout, etc.) underlying the renal or arterial disease. The growth in the number of deaths attributed to arterio-sclerosis implies a corresponding diminution in numbers listed to other causes, so that an artificial decline in mortality from certain causes dependent on arterial disease must result. The importance of ascertaining as far as possible to what causes these deaths would have been allocated in the absence of mention of arterio-sclerosis, and how the numbers so lost to various other headings compare with the numbers still allocated to them, is recognized, and investigation of the matter is in hand but has been interrupted by the war. A preliminary examination of the certification of deaths in London males in 1914 tends to show that cerebral haemorrhage loses more deaths than any other one cause from the increasing popularity of arterio-sclerosis as a form of certificate.

SPECTACLES FOR SOLDIERS.

THE army authorities, we are informed, do not supply soldiers with spectacles whose lenses have a strength of less than one dioptre. It has been suggested that this is a mistake, and inflicts an unnecessary hardship upon the men. It seems to us that a distinction should be made between soldiers in the field and those engaged in office duties. The men in the Army Pay Offices and the Record Offices, for instance, often work for very long hours, and many of them suffer from eye-strain in an aggravated form. Ophthalmic surgeons who work near these offices

[1] *A New English Dictionary on Historical Principles.* Vol. ix, *Si—Th*; Section *Supple—Sweep.* By C. T. Onions, M.A.Lond., Honorary M.A.Oxon. Oxford: At the Clarendon Press. March, 1918. (Price 5s. net.)

must have been struck with the number of soldiers who consult them for this cause. In times of stress the hours of work are very long, twelve to fourteen hours being not uncommon. It is essential, in these circumstances, that any error of refraction or of muscle balance shall be accurately corrected, and we think that for these men the rule should be modified. In the case of soldiers on active service in the front area conditions are different. Many of them do not use their eyes for much close work, and men with gross errors of refraction are eliminated. It is important to keep the spectacles as simple as possible; they are frequently lost or broken, and the arrangements for replacing them must be easily worked. For these men small errors are not at all important, and even were glasses provided they would not be worn. The object is to give good average acuity, rather than to prevent eye-strain. Young healthy men living an outdoor life do not suffer from asthenopia, and so do not require glasses of low power. But even in this case it seems to us that a cylinder as low as half a dioptre might be allowed when combined with a sphere of one or more dioptres. As far as we can learn the arrangements made for the supply of spectacles to the troops have worked well, and a good substantial article has been provided.

DRIED MILK.

THE Local Government Board has issued an admirable report by Dr. F. J. H. Coutts on Dried Milks, with special reference to their use in Infant Feeding.[1] As a result of exhaustive inquiry Dr. Coutts is satisfied that dried milk is a valuable food, possessing certain special advantages which are likely to lead to its use being greatly extended in the future. In the first place, the labour and cost of transporting the water (which represents about seven-eighths of the total weight of fresh milk) are avoided. Dried milk is also easily handled and stored, while under suitable conditions it remains fit for food for reasonably long periods. It is convenient and economical in use, for the consumer can make up just what is needed for a particular occasion and no more. Dried milk is not germ-free, but the proportion of bacteria contained is extremely small as compared with ordinary milk, and bacteria do not tend to multiply on keeping. While dearer than an equivalent amount of fresh market milk, it is cheaper than milk specially prepared for infants. Dr. Coutts has obtained a great deal of evidence to support the view that when breast feeding is impossible dried milk of recent manufacture, made carefully under hygienic conditions from a good quality of cow's milk, is a very valuable food for infants. There are several processes for preparing milk powder, but two methods are most commonly employed: in the one liquid milk is sprayed over metal cylinders heated internally, in the other after partial condensation it is sprayed into heated air. The chief aim is to get milk in a solid state with as little change as possible in its constituents. When carefully prepared from good fresh milk the powder keeps for several weeks or months, if moisture is excluded, but it is generally conceded that the product of the hot roller process keeps better than the powder made by spraying milk into hot air. On mixing one part by weight of the dried powder with seven parts by weight of warm water a liquid is obtained corresponding in composition to ordinary milk, though with a slight "boiled" taste; there is a tendency for a little solid matter to settle and for fat to rise to the top. Dried milk made from full-cream milk contains 26.62 per cent. of fat, 24.46 per cent. of protein, 36.98 per cent. of milk sugar, 6.12 per cent. of mineral matter, and 4.32 per cent. of water. As put on sale in this country the powder usually comes under one of four classes: full cream, three-quarter cream, half cream, and skimmed. For infant feeding the full cream variety should alone be used in ordinary cases, in dilutions suitable to different ages. When made up with the proper amount of water it contains the essential food elements in a proportion more suitable for the baby than diluted full-cream sweetened condensed milk which contains an excess of sugar. Thus it comes about that at official infant welfare clinics the use of dried milk is increasing, as on the whole the most suitable food for babies when they cannot get breast milk. Prolonged experience at infant welfare centres indicates no ground for fearing that dried milk leads to scurvy or rickets, but it is thought desirable to give a little orange or grape juice to the baby once or twice a week. There is evidence to show that dried milk is also a valuable food for nursing mothers. While the processes used in drying milk largely reduce the proportion of bacteria present, special precautions must be taken to avoid recontamination during powdering and packing of the dried product. Hence the most scrupulous cleanliness should be observed in the factories; when milk is dried at the farm special premises should be set apart for the purpose, and the milk should be dried as soon as possible after it is drawn from the cow.

[1] New Series, No. 116. Food Reports No. 24. H.M. Stationery Office. 2s. net.

THE MATERNITY AND CHILD WELFARE BILL.

THE Maternity and Child Welfare Bill, introduced by the President of the Local Government Board on March 14th, bears evident signs of being a compromise, and leaves some doubt whether it is not a compromise so weak as to be practically useless. As will have been gathered from the note published on March 23rd, p. 354, it proposes that a local authority may make such arrangements as may be sanctioned by the Local Government Board "for attending to the health of expectant mothers and nursing mothers and of children who have not attained the age of 5 years and are not being educated in schools recognized by the Board of Education." The local authorities are to be the county councils and councils of any borough or urban district with a population of over 20,000 or any district council which may be judged to be in a better position to make arrangements than the other councils. The proviso that nothing in the Act "shall authorize the establishment by any local authority of a general domiciliary service by medical practitioners," is apparently designed to prevent the establishment of a second domiciliary service side by side with the panel service under the National Insurance Acts. Provision is made for the constitution and appointment of maternity and child welfare committees by such local authorities as exercise their powers under this Act or under the Notification of Births (Extension) Act, 1915. It will be noticed that the bill is purely permissive; it would be for each local authority to determine whether it should or should not make arrangements for attending to the health of the mothers and children. Judging from past history, it seems probable that if the bill were to become law in its present form the more progressive local authorities would take advantage of it, but that a very large proportion of local authorities would not, especially as they could find many excuses for doing nothing in the conditions produced by the war, which must continue for some time after its termination. On the other hand, there are a good many recent instances of permissive legislation which, after it has been put into force in a number of districts, has been made compulsory throughout the country, and the idea of the Local Government Board may be that the precedent should be followed in this case. However this may be, it is quite clear that the bill does not in any way satisfy the demand for the establishment of a Ministry of Health. It would be one of the first duties of such a Ministry to give attention to maternity and child welfare, and the ineffective nature of Mr. Hayes Fisher's bill is really an additional argument for the speedy establishment of a Health Ministry.

THE WAR.

LESIONS OF PERIPHERAL NERVES RESULTING FROM WAR INJURIES: PATHOLOGY AND TREATMENT.

THE following is the conclusion of the report of the meeting at Alder Hey Military Orthopaedic Hospital on December 8th, 1917, the earlier part of which was published last week, p. 379.

RE-EDUCATION AND FUNCTIONAL DISABILITIES OF ACTIVE SERVICE.

Dr. WILLIAM CUTHBERT MORTON, having outlined the methods adopted by him in investigating functional cases, went on to deal with their treatment. The patient was first assured that while his disability was very real, there was no reason why it should not yield to treatment. If any part of the disability was due to actual and permanent damage to the tissues, he was warned not to look for any improvement in this direction. If an organic lesion was causing no trouble except through suggestion, he was assured that this was not disabling him. Where there was no organic lesion, or one which caused no trouble whatever, he was told that through shock or otherwise he had lost control of his muscles, which required to be disciplined if he was to regain control. As far as possible he was trained to observe what muscles were at fault, and wherein the fault lay, so that when the treatment was being carried out he might realize what he was to try to do, and, above all, when he had succeeded in doing it. If there was inco-ordination he was taught, first, to relax all the muscles of the part, and then to execute the particular movement in the simplest and most natural way. When a muscle was in spasm it should be made to relax by removing all tension, or else by stretching it either by manipulation or by splinting. A flaccid muscle might be induced to contract by gentle tapping, but it was better to employ electricity, or what was called excitation. Electricity was employed in the form of the faradic current with two terminals, or in a bath. In the bath all the muscles of the part were simultaneously stimulated by the same current, so that the strongest group of muscles would prevail. Simultaneous faradism had been applied independently to each of the great nerve trunks of the part; by regulating the strength of current for each nerve it was possible either to balance the muscles against each other or to cause each group in turn to prevail over its antagonists. In this way the muscles worked under varying tension, and their sensory nerves conveyed to the spinal cord and higher centres impulses which tended to recall to the patient the sensations which accompanied the vigorous use of the limb before it was disabled. Excitation consisted of smart simultaneous active and passive movements. If a muscle were suddenly stretched it would contract in order to save itself from injury. It would be suddenly relaxed only by stretching its antagonists, and it would then contract reflexly in order to steady the joint. If these passive movements were made to coincide with active effort on the part of the patient each group of muscles would be trained to contract or relax at the moment when its antagonists were relaxing or contracting. Besides excitation, special exercises were often needed, for an almost trivial change in the re-education might make all the difference in the result; a slight readjustment of the muscular effort, for instance, might double the stride. Massage, gymnastic exercises and drill all had their place. Massage was of value chiefly where muscles had become atrophied through disuse, as in a flaccid limb, or worn out through overaction, as in long-continued clonus. In spastic cases electricity and massage were actually harmful. Hypnotism was never employed.

USE OF MEMBRANE IN NERVE SUTURE.

Major R. C. ELMSLIE pointed out certain difficulties in diagnosis, more especially in cases showing a functional element added to an organic lesion. He also alluded to the difficulty of knowing how to act in cases where the paralysis had followed immediately after an injury; he was inclined to think that such cases should be more frequently subjected to exploratory operations. With regard to wrapping sutured nerves in membrane, he mentioned an instance in which the nerve was exposed some time after this procedure and found for a distance of three inches to be converted into a dense mass of fibrous tissue of cartilaginous hardness. In this mass of tissue were seen small pieces of Cargile membrane. His preference was for fascia containing fat. He criticized Captain McMurray's opinion that the tendo Achillis should be divided in all cases of lesion of the external popliteal nerve.

TESTING AND RECORDING OF FUNCTION.

Captain BURROW emphasized the importance of co-operation between surgeons and neurologists, and the desirability of having in all centres a uniform method of examining and keeping records of cases, and described the methods employed by him at Leeds for testing and recording sensory and motor functions. Electro-diagnosis was most useful in conjunction with careful neurological examination. When careless short cuts were taken and electro-diagnosis was asked to give a full diagnosis, errors must arise. Electro-diagnosis would tell the observer something of the state of the nerve and muscle that was under the electrode, but nothing as to the actual condition at the site of the nerve injury. A positive response to faradism was always useful; it definitely decided the reflex lesions and functional cases and gave information in partial organic lesions. Absence of faradic response meant very little, especially in muscle groups which had been neglected. He had seen faradic response return a few days after careful splinting of an overstretched group of muscles. Voluntary movement was also present in many muscles as a lesion recovered before faradic response was obtainable. A living muscle with varying chemical changes was liable to change polarity. In well nourished muscles with the limb warm he had often noted the KCC greater than the ACC even in complete division of the nerve of supply. The character of the contraction was much more important. The slow vermicular contraction or longitudinal contraction which passed like a wave from the neighbourhood of the testing electrode was usually found to be associated with complete lesions of nerve conductivity.

The diagnosis was often completed at operation, when the exposed nerve was tested for conductivity by the faradic current. He condemned the rough naked eye decisions made by some surgeons as to the conductivity of a nerve, for clinical and microscopical evidence proved them to be wrong again and again. There might sometimes be more loss of function after operation than before it, but the loss incurred temporarily was often unimportant when perfect adaptation of the cut ends was obtained. The eventual recovery of function was often much more rapid after total division and suture than after operations for the freeing of the nerve.

OPERATIVE TREATMENT OF EXTRAMURAL AND INTRAMURAL DAMAGE.

Major S. ALWYN SMITH said that he used a sleeve from the tensor fasciae femoris as a covering in all cases where scar tissue which could not be fully removed surrounded a nerve, and also in all cases in which linear capsulotomy was performed for interstitial fibrosis. No undue formation of fibrous tissue resulted. Dissection of a case operated upon five months previously showed that the sleeve had not changed its character, and that it was easily separated from the subjacent capsule of the nerve.

He asked for opinions as to the operative procedure to be adopted in the following circumstances:

1. *Extramural Damage.* — Cases of long-continued damage due to aneurysms which had produced traction and pressure on a nerve, or to scar tissue producing constriction, where the nerve capsule was intact, but where the damaged portion of nerve was found like string or tape and did not conduct mild faradic current. He had encountered three such instances. Was it advisable to sacrifice the damaged portion, followed by end-to-end suture; or, as had been his custom, was it sufficient to perform linear capsulotomy with or without a fascial sleeve? So far he had not obtained good results in the few cases of this description that he had encountered.

2. *Intramural Damage.*—Partial lesions showing well-marked interstitial fibrosis, more or less diffuse, might

slightly conduct faradism applied directly at operation, and were often the origin of causalgia. Was it justifiable to remove the damaged portion and perform end-to-end suture, or had the results of removal of the fibrous nodules and capsulotomy been satisfactory? He had had several cases of this nature in which he had been inclined to take the heroic course, despite the fact that one or two muscles whose nerve supply was derived distal to the damage were still acting.

ELECTRICAL EXAMINATION.

Captain STANLEY BARNES said that it was important to study the distribution of the muscular atrophy. In nerve section the muscles supplied, if examined a month or more after the damage, were much smaller than those innervated by untouched nerves, although the unaffected muscles might lie adjacent to the atrophied ones and might subserve somewhat similar functions. This was never the case in atrophy due to joint lesions, when all the muscles that could cause movement at that joint showed a fairly level degree of atrophy. A muscle a few weeks after severance from its motor nerves was atrophied and of pale yellow colour. The microscope showed loss of striation, a relative and possibly actual increase in the number of nuclei, and considerable loss of sarcoplasm with no loss of supporting structures. This uninnervated muscle, owing to its severance from the nervous system, would cease to contract to any volitional stimulus, and if no treatment were applied, would tend slowly to lose its capacity once more to become normal muscle. If any neighbouring healthy muscles when in action moved the lymph flow in this latent muscle, then the process of atrophy was slow, and it might be that suture of its nerves years after section would result in recovery. But in most situations after the lapse of a few years in which no treatment had been maintained, a nerve suture, though surgically successful, would fail to restore function in the atrophied muscle. The reaction of degenerated muscle to electricity was peculiar; to faradism it ceased altogether in a very few days after the axis cylinders had been divided. The galvanic excitability during the early days of the process of degeneration was often increased, but within a fortnight (when faradic excitability was usually lost) the curve of excitability dropped to normal, and from this stage onwards fell gradually, until the final stage of atrophy was reached in which no reaction to galvanism occurred. There was no motor point to a degenerated muscle, for it had no nerve supply. The galvanic electrode was best applied on the bare dissected muscle itself, and this was, in theory, the only way to find out whether the tertiary degeneration—atrophy—was so complete that nerve suture was bound to fail. In practice this was not done, as it involved a further wounding, and it was known from experience that, certainly up to two years after injury, it was worth while to attempt suture.

Any successful stimulus to a degenerated muscle fibre always resulted in an unusual type of contraction; instead of the normal sharp flick, so quick as to appear instantaneous to the eye, which occurred either at the make or break of a continuous current in a normal muscle fibre, there was a slow wavy contraction which took an appreciable part of a second to reach its maximum and an equal time to die down. The same type of contraction could be obtained by mechanical irritation of a superficial muscle like the deltoid when it was lightly but sharply tapped by a percussion hammer. In testing for electrical excitability by faradism or galvanism it was easier to observe accurately which muscle or tendon moved if the muscles were rendered flaccid by light fixation of the limb.

A muscle which had undergone Wallerian degeneration gave no reaction to faradism, showed an altered degree of excitability to galvanism, and gave a slow wave of contraction to galvanism, with a polar reaction of ACC greater than KCC. The combination of these four factors constituted the full reaction of degeneration, but three only were of value. Reaction to faradism meant that some nerve fibres at least were uncut. A negative result was unsatisfactory and galvanic testing was very desirable; a positive slow wavy contraction to galvanism was more reliable than failure of the faradic reaction. The polar reaction was not quite so important. If KCC = ACC it was probable that some healthy muscle fibres were contracting with some degenerated ones; in any case great care had to be exercised to determine clearly that the reaction referred to the muscle under test only. When the reaction of degeneration was present with a positive wavy contraction to galvanism, physiological nerve section might safely be assumed. A functional or hysterical paralysis gave normal muscle reactions; muscles damaged by local disease or injury or by ischaemic contracture usually gave a feeble reaction to faradism; to galvanism the reaction was quick with KCC > ACC. Whenever a muscle had given this reaction after possible damage to its nerve, all other factors having been eliminated, it had been assumed that the corresponding nerve fibres had been cut.

In examination for alterations in sensation he used pin-prick tests almost entirely. The tendency had been to rely more upon muscle testing than upon sensory changes in advising treatment; only very rarely had any discrepancy in diagnosis arisen. Usually where damage to a mixed nerve was severe but incomplete, the motor damage predominated.

In all cases of complete physiological block of the nerve he had advised operation if reasonably practical. When, however, the lesion was incomplete, as for instance when some sensory fibres were intact, he had waited for a time. On the whole, he had come to the conclusion that he would have done better to advise operation more freely. When some of the muscle supplied gave reaction to faradism, he now advised exploration, unless signs of further restoration of function occurred within a month, as recovery was more rapid after clearing away scar tissue.

Prognosis.

Cases of motor or mixed, and sensory nerves which had been completely divided and subsequently sutured were alone discussed, and it was assumed that the surgical reunion was successful and that the after-treatment was sufficient. Many cases had been recorded in which, after complete section and reunion of the nerve, voluntary power in its muscle supply had returned within a few days or weeks; many more had been recorded in which sensory restoration was claimed within a few days. His own experience, extending to about forty cases of complete section by gunshot wounds and reunion by surgical means, was that no such return of physiological function could be expected for at least six months after suture; that usually nine months elapsed before the first signs of motor recovery occurred; and that full recovery of motor power was to be expected only after some eighteen months or two years. He had seen no evidence of any return of sensory function at an earlier stage than five and a half months, and no case of complete return of sensory function, although he had examined a few cases as late as twenty months after operation.

The point was important because, after suture of a musculo-spiral nerve, the surgeon might assume that the union had failed because no return of function had occurred three months later, and operate again. The records of cases of immediate and rapid recovery (say within six months after suture) were due to errors of observation attributable to mistakes in recognition of tissues at the time of operation, and to reliance on the report of unskilled observers at the time when "recovery" was reported. It was not difficult, when operating in a mass of scar tissue in an axilla, to mistake the internal cutaneous nerve for the median; careful examination was required to determine whether there was any real recovery of motor power in the median motor supply, and the testing of cutaneous sensibility needed considerable skill and consummate patience. Another source of error was incomplete diagnosis before operation—the mistaking of a functional for an organic paralysis.

Discrepancies of observed results as regards return of sensation, and possibly of muscle power, might be explained on the ground that all uninnervated living tissue appeared to exert an attraction for neighbouring nerve fibrils. Even without sensory nerve suture, an anaesthetic area due to nerve injury tended constantly to diminish in size, particularly as regards protopathic sensation. Therefore it was not to be assumed that shrinkage in anaesthetic areas after nerve suture was due solely to return of function of the nerve; the impulses might be passing by another route.

If the men disabled by nerve section required a minimum of twelve months' after-treatment, special arrangements

must be made both as regards their army service and their treatment.

Captain PLATT said that in an experience of 106 operations, the great majority of which had been for end-to-end suture or simple neurolysis, he had been specially interested in two types of lesion: (*a*) those in which there was a localized intraneural scar of great density occupying a definite area in the cross section of the nerve trunk associated with paralysis of one muscle group, and (*b*) those in which with complete division of a nerve and extensive loss of substance, end-to-end approximation could not be obtained in spite of acute flexion of joints. Working with a fine probe electrode and the Bristow coil, he had been able to confirm at operations the topography established for the median and ulnar nerves in the upper arm. In this type of lesion a simple neurolysis would not influence regeneration in the blocked segment. Careful exsection of the intraneural scar was a legitimate operation, and in his own experience had been followed by good results.

In fourteen cases in which the gap was large he had used nerve grafts. At the present conduction had been definitely established across the gap in three cases only. In a case of median injury in the upper arm, five months after the insertion of a graft two inches in length power had returned in the flexor longus pollicis and there was a diminution in the area of anaesthesia.

Insulation of a nerve after operation rested on a sound physiological basis. He always used fascia; where a graft was used a fascial tunnel was essential. The use of sterile vaseline or olive oil as a preventive of perineural adhesions seemed logical, but he had not been impressed by cases in which these substances were employed.

Radium Emanation.

Captain WALTER STEVENSON spoke of the beneficial effects which he had found to result from the exposure of scar tissue to radium emanations in freeing structures matted together by scar tissue, and in relieving the pain and trophic changes following nerve involvement. The anaesthetic effect of radium on scar tissue was definite and immediate, and persisted for a week or more. This was useful in mobilizing the fixed and painful joints, especially of the hands.

RESULTS OF NERVE SUTURE.

Captain S. W. DAW, after mentioning the indications for and against operation in nerve injuries, gave some details of the method he employed for the union of divided nerves. He preferred a continuous suture of fine catgut; when it was impossible to remove all surrounding scar tissue he wrapped round the suture line with Cargile membrane dipped in hot vaseline. Operations for freeing nerves were often disappointing. He gave details of 35 cases (great sciatic 5, external popliteal 2, musculo-spiral 5, median 4, ulnar 19). The disproportionate number of ulnar cases, due to the records being more easily got, might have minimized the favourable aspect of the results. The average time between wound and suture was under seven months, and the average time between suture and last examination was also under seven months.

The *two external popliteal* sutures showed signs of regeneration in improved sensation and electrical response within 2 and 3 months respectively.

Of the *five great sciatic* cases two showed voluntary movements of flexion and extension of the ankle 17 and 18 months after suture. Two showed improvement in sensation and electrical reaction 4 and 5 months after suture. One showed no improvement 7 months after suture.

Of the *five musculo-spiral* cases four showed complete recovery 7, 8, 10, and 11 months after suture, three of these having gone back to duty.

The *four median* cases were all high—that is, at or above the elbow. Two cases showed voluntary action of all muscles 4 months and 13 months after suture. In neither case had sense of light touch returned. The other two showed electrical improvement in 3 and 6 months.

Of the *nineteen ulnar* cases, four showed good voluntary action, including practically all the hand muscles, 4, 4, 7, and 13 months after operation. Three of these were at or above the elbow, one low in the forearm. Seven showed signs of recovery, such as loss of R.D., return of protopathic sensation, or voluntary movements of individual muscles, 3, 3, 4, 6, 7, 7, and 9 months after suture. These were chiefly low sutures. They included three cases of the interesting but quite unsound procedure of ulnar median anastomosis. In these there was protopathic return over much of the ulnar distribution in the hand, in one case referred to the tip of the index finger. Time will show how far recovery proceeds, but some permanent loss of function of the borrowed median nerve is feared. The remaining eight ulnar cases showed no signs of recovery. Their average time since operation was under 7 months.

Review of the Results.

	Cases.		
Good recovery of voluntary action	12;	roughly	34%
Signs of recovery	14	,,	40%
No results as yet	9	,,	26%

CASUALTIES IN THE MEDICAL SERVICES.

ARMY.

Killed in Action.

LIEUT.-COLONEL J. ROBERTSON, R.A.M.C.(T.F.).

Lieut.-Colonel James Robertson, R.A.M.C.(T.F.), was killed in action on March 21st, aged 39. He was the son of the late Mr. John Robertson of Aberdeen, and was educated at Aberdeen University, where he graduated M.B. and Ch.B., in 1904, M.D. in 1908, and Ch.M., with honours, in 1909; also studying in Dublin, Hamburg, and Berlin. After acting as house-surgeon at the Aberdeen Royal Infirmary and as clinical assistant at the Samaritan Free Hospital and at St. Mark's Hospital, London, he made a voyage to South America, and in 1906 took an appointment as medical officer to a tea garden in the Duars, Northern Bengal. Returning home after about a year, he went into practice in Aberdeen, where he was parochial medical officer and senior assistant anaesthetist to the Royal Infirmary. In his student days he was an enthusiastic volunteer, and on his return home joined the 1st Highland (Aberdeen) Field Ambulance, in which he attained the rank of captain on October 14th, 1911, and of major on November 29th, 1914. During the war he had risen to the command with the rank of lieutenant-colonel, and had been mentioned in dispatches.

CAPTAIN B. G. BEVERIDGE, M.C., R.A.M.C.(T.F.).

Captain Bernard Gordon Beveridge, M.C., R.A.M.C.(T.F.), was killed in action on March 21st. He was the only son of Dr. Beveridge, and was educated at Gordon's College, Aberdeen, and at the university in that city, where he graduated M.B. and Ch.B. in 1912. He joined the 1st Highland (Aberdeen) Field Ambulance as lieutenant on November 21st, 1914, and was promoted to captain after a year's service. He had been in France almost ever since he joined. He received the Military Cross on November 19th, 1917.

CAPTAIN H. DUNKERLEY, R.A.M.C.

Captain Harold Dunkerley, R.A.M.C., was killed in action on March 23rd, aged 28. He was the younger son of Mr. Herbert Dunkerley, of Bombay, and was educated at Downing College, Cambridge, where he graduated B.A. in 1912, and subsequently M.A., and at the London Hospital, taking the diplomas of M.R.C.S. and L.R.C.P. Lond. in 1914. After acting as surgical clinical assistant at the London Hospital, he took a temporary commission as lieutenant in the R.A.M.C. on December 1st, 1914, and was promoted to captain after a year's service. He went to the front in 1915, and served for nine months with the Rifle Brigade, till he was wounded and invalided home. Three months later he returned to France, and served successively with a stationary hospital, with the North Somerset Yeomanry, and with a field ambulance.

CAPTAIN E. NEWTON, R.A.M.C.

Captain Eric Newton, R.A.M.C., reported missing in East Africa on August 5th, 1917, is now presumed killed on that date, aged 28. He was the son of Captain I. Newton, medical officer of Bhatinda, and was educated at Aberdeen University, where he graduated M.B. and Ch.B. in 1915, taking a temporary commission in the R.A.M.C. soon after. He was a Scottish international hockey player.

Died of Wounds.

CAPTAIN H. T. LUKYN-WILLIAMS, R.A.M.C.

Captain Herbert Temple Lukyn-Williams, R.A.M.C., died of wounds on March 27th, aged 32. He was the second son of Canon Lukyn-Williams, of Guilden Morden,

and was educated at Edinburgh University, where he graduated M.B. and Ch.B. in 1911. He took a temporary commission as lieutenant in the R.A.M.C. on February 1st, 1915, and was promoted to captain on completion of a year's service. He was attached to the Sherwood Foresters when he was fatally wounded.

CAPTAIN J. C. METCALFE, M.C., R.A.M.C.(T.F.).

Captain John Clifford Metcalfe, M.C., R.A.M.C.(T.F.), was reported to have died of wounds, in the casualty list published on March 27th. He was educated at Leeds University, and after graduating M.B. and Ch.B. with first class honours in 1912, went into practice at Liversedge, Yorkshire. He joined the 1st West Riding (Leeds) Field Ambulance as lieutenant on October 13th, 1914, and received the Military Cross on June 3rd, 1917.

Wounded.

Major M. A. Power, M.C., R.A.M.C. (temporary).
Captain H. T. Chatfield, R.A.M.C. (temporary).
Captain A. S. Hendrie, R.A.M.C. (temporary).
Captain F. P. Fisher, R.A.M.C. (temporary).

DEATHS OF SONS OF MEDICAL MEN.

Cameron, John Hunter, Second Lieutenant, eldest son of the late Dr. John Cameron, of Lochgilphead, Argyllshire, died at Fatehgarh, on March 4th, of pneumonia following malarial fever, contracted during two years' active service in East Africa, aged 29. He was educated at Cheltenham College and at Edinburgh University, where he graduated B.Sc., subsequently going to India as a civil engineer. A brother, in the Royal Flying Corps, was killed in August, 1917.

Davenport, Arthur Allan Orme, M.C., Lieutenant East Lancashire Regiment, elder son of Dr. Arthur F. Davenport, of St. Kilda, Melbourne, died of wounds on March 24th, aged 24. He was educated at Geelong School, where he was head of the school, stroke of the eight, and captain of football. He got his commission in 1915, served in Gallipoli, being present at the evacuation, and then in Egypt, till January, 1917, when he was sent to another front. He was wounded on April 24th, 1917, and on the same occasion received the Military Cross. He returned to the front on January 26th, 1918.

Drummond, Kearsley, Captain Northumberland Fusiliers, fifth son of Dr. David Drummond of Newcastle-on-Tyne, died of wounds March 24th. He got his first commission on September 12th, 1914.

Macklin, J. J. M., Lieutenant King's Own (R.L.) Regiment, attached to the 12th Lancashire Fusiliers, youngest son of Dr. T. T. Macklin, J.P., of Lancaster, killed in action at Salonica on March 12th, aged 23. He was educated at Plymouth College and the Blackburn Royal Grammar School and subsequently at the Ontario Agricultural College, Guelph, Canada, where he took the diploma in agriculture. He was a member of the O.T.C. there, and was one of six students brought over by the War Office and granted commissions in British regiments in 1915. His health was so much impaired by an acute attack of appendicitis and operation in 1916 that he was gazetted out, but immediately rejoined for home service and six months later was passed fit for overseas and was sent to Salonica. Two of his brothers are serving at the front, one in the R.A.M.C. and one in the Royal Artillery.

Matthews, David J. W., Private Canadian Forces, son of the late Dr. Matthews, of Belmont, Canada, killed February 17th.

Schäfer, John Sharpey, acting Commander R.N., elder and only surviving son of Professor Sir Edward Schäfer, F.R.S., of Edinburgh University, killed at sea March 22nd, aged 36. He joined the navy in 1895, and was for some time naval assistant in the Hydrographic Department at the Admiralty, but had retired previous to the war. His brother, Lieutenant T. S. Schäfer, Northumberland Fusiliers, was killed on September 26th, 1915.

MEDICAL STUDENTS.

Brereton-Barry, W. R., Second Lieutenant, reported wounded and missing on August 16th, 1917, now officially presumed killed, was the second son of Judge Brereton-Barry. He obtained his commission in the Royal Dublin Fusiliers in February, 1916, at the age of 18; served through the rebellion in Dublin, and went to the front in March, 1917. He was a second-year medical student at Trinity College, Dublin. On August 16th he was severely wounded in the arm, but refused to go to the dressing station, and insisted on going forward with his men. He led an advance into the enemy lines, in the course of which his right leg was shattered by a shell. Next morning he sent a note by a runner to his battalion saying he was in a shell-hole within the German lines. Search parties were sent out that night, but failed to find him.

Simon, Frank, killed in France early in January last, was a fourth-year medical student in the School of Physic, Trinity College, Dublin. Immediately upon the outbreak of war he volunteered for active service and received a commission in the Royal Dublin Fusiliers in September, 1914. Since then, until the time of his death, he had been on active service with the B.E.F. in France.

[We shall be indebted to relatives of those who are killed in action or die in the war for information which will enable us to make these notes as complete and accurate as possible.]

HONOURS.

Two Supplements to the *London Gazette*, issued on March 26th, contain further lists of awards for gallantry and distinguished service in the field. The following medical officers are among the recipients of the awards indicated:

To be Brevet Lieut.-Colonel.—Majors (temporary Lieut.-Colonels) R. M. Barrow and M. Mackelvie, I.M.S.

Distinguished Service Order.—Captain J. Scott, I.M.S.

Military Cross.—Captains A. C. Ainsley, R.A.M.C., W. E. H. Bull, R.A.M.C., C. A. Godson, I.M.S., W. Goldie, R.A.M.C., J. D. Kidd, R.A.M.C., P. J. Moir, R.A.M.C., C. N. Davies, I.M.S., B. M. Tuke, R.A.M.C.(S.R.), R. G. Walker, R.A.M.C.; temporary Captains W. K. Bigger, R.A.M.C., N. M. Cummins, R.A.M.C., B. Knowles, R.A.M.C., R. Stansfield, R.A.M.C.; Lieutenant C. W. W. Baxter, I.M.S.; temporary Lieutenant V. K. Apte, I.M.S.

The name of Major (temporary Lieut.-Colonel) Charles Algernon Stidston was incorrectly printed in the notification of the conferment of the D.S.O. published in the Supplement to the *London Gazette* of February 4th, 1918 (BRITISH MEDICAL JOURNAL, February 9th, p. 187).

NOTES.

THE MEDICAL SERVICES OF THE BRITISH ARMIES IN FRANCE.

THE KING, who during his two days' visit to the armies in France travelled some three hundred miles and visited many centres, seems to have spent much of his time with the 3rd Army, which holds the line in the neighbourhood of Arras. In the letter he wrote to Field-Marshal Haig on his return to London he spoke of the indomitable courage and unflinching tenacity with which the troops have withstood the supreme efforts of the greater part of the enemy's fighting power. He visited many hospitals and casualty clearing stations, and conveyed his impression of them in the following sentence:

"In a large casualty clearing station I realized what can be accomplished by good organization in promptly dealing with every variety of casualty of greater or less severity, and passing on by trains to the base hospitals those fit to travel. The patient cheerfulness of the wounded was only equalled by the care and gentleness of those ministering to their wants."

MALARIA.

The following Army Council Instruction, which is of general application—that is to say, it includes men belonging to Overseas Contingents—was issued on March 29th:

Officers and men who have been returned home on account of malaria will not in future be available for posting to a theatre of war where malaria is prevalent, namely, Salonica, Egypt, Mesopotamia, or East Africa. They will, however, be available for other theatres of war when otherwise fit. The documents of all such men will be clearly endorsed—"Malaria case—not available for a theatre of war where malaria is prevalent."

Scotland.

CONDITIONS OF ADMISSION TO SCOTTISH UNIVERSITIES.

THE draft ordinance making new regulations for admission to the Scottish universities, which, as has been noted, received the approval of the General Council of the University of Edinburgh last month, is also approved, we understand, by the other Scottish universities. The institution in 1892 of the preliminary examination in each faculty was due to the recommendation of the University Commissioners under the Act of 1889. They made the recommendation with reluctance and looked upon it as a temporary measure only, designed to meet a difficulty which they hoped would be removed as the standard of secondary education in Scotland improved. Before 1892 many students unfit for university study entered the universities, which consequently had to do much work on the secondary school level and to maintain junior classes in such subjects as Latin, Greek, and mathematics, solely to help students insufficiently prepared for attendance at the senior or graduating classes. Only between 10 and 20 per cent. of the students now present themselves for the preliminary examinations; the remainder are admitted through the machinery of the leaving certificate examinations. The universities appear to have agreed that

the time has come to abolish these temporary expedients. The new ordinance, according to the Scottish *Educational News*, "marks a real revolution in Scots education. It is the beginning of the end of externalism in examinations. The question whether or not a student is to be admitted to a graduation course will depend henceforth, not on the result of an examination in one or two subjects, but upon the length and the character of his secondary school course, and on a report from his teachers as to how he did his work during that course. We understand that something in the nature of a concordat has been drawn up between the Universities and the Education Department, by which the leaving certificates will be awarded on the same principle." The Entrance Board will have large powers; it will be able to accept the leaving certificate of the Scottish Education Department or other certificate deemed equivalent thereto. The equivalence will be determined not by examination, but by the result of the work done during the period of secondary education. The intention appears to be to replace the test of a single examination by the more prolonged test of general progress over a number of years. The draft ordinance contains paragraphs co-ordinating this change with the existing certificates from schools in places outside Scotland, but the general principle will be maintained. The change will throw a greater responsibility on the secondary school teachers of Scotland, but is not altogether without precedent; it was tried in the training colleges some fifteen or twenty years ago, and was successful. It is expected that it will be no less successful in the wide field of secondary education.

Ireland.

PARLIAMENTARY REPRESENTATION OF QUEEN'S UNIVERSITY, BELFAST.

A LETTER to those graduates of the university who will have the right to vote has been issued by the honorary secretaries of Sir William Whitla's committee; these secretaries are representative of the faculties of medicine, arts, science, law, and engineering, and also of women graduates. It sets forth Sir William's claims and qualifications, and urgently calls upon all potential voters to write to the secretary of the university without delay and see that their names are properly enrolled, and that everything is in order, so that any mistake or error may be rectified before it is too late. This is emphasized as of vital importance. This is a unique opportunity of obtaining a medical representative who knows the problems of the day, and can devote his whole time to the work. No other medical candidate has appeared, and it is improbable that any will now come forward. Mr. R. T. Martin, B.A., solicitor, senator of the university, who has been much interested in university matters, and Mr. R. M. Henry, M.A., Professor of Latin, are also mentioned as possible candidates.

UNIVERSITY COLLEGE, CORK, AND A MUNSTER UNIVERSITY.

The governing body of University College, Cork, has unanimously expressed its opinion that the success of the College as an institution of higher education in Cork is seriously hampered by its position as a member of a federal university. Besides the inconvenience and waste of time due to journeying between Cork and Dublin, it is held that the dissimilarity of local conditions limits development of the College in various important directions. The Government is therefore called upon to introduce the necessary legislation for constituting an independent university in place of the present dependent college. In making this request the great industrial developments now taking place in Cork are emphasized. The governing body has also issued in pamphlet form a statement in support of the claim for establishing a separate university for Munster.

IRISH ASYLUM WORKERS.

At a meeting of the Down District Asylum Branch of the Asylum Workers' Association, on March 25th, Dr. M. J. Nolan, who presided, pointed out the desirability at the present period of unrest of discussing how best to maintain the honourable position of the association, and to safeguard it from any conduct tending to besmirch its good name or lower the status of its members in the eyes of the public. On the motion of two of the attendants, a resolution was unanimously carried extending sympathy to those in other institutions who were seeking to better their positions, expressing the hope that such improvement would be secured by the methods adopted by the Asylum Workers' Association, and deprecating very strongly the resort to strikes. At the same time, the view was expressed that committees were not free from blame in failing to provide their employees with suitable remuneration, having regard to the high cost of living.

MORTALITY IN IRELAND, 1866–1915.

Sir W. Thompson, Registrar-General for Ireland, in his address to the Section of State Medicine of the Royal Academy of Medicine in Ireland, dealt with mortality in Ireland for fifty years (1866–1915). Comparing the five-year periods 1866–70 and 1911–15, he showed that while the mortality in England and Wales had decreased 36.4 per cent. and in Scotland 28.7 per cent., in Ireland it had increased by 2.1 per cent. This difference he attributed in a great measure to emigration, the young and healthy going away. Fully 85 per cent. of emigrants in recent years were between 15 and 35 years of age. The infant mortality rate in Ireland in the period 1911–15 was 21 per cent. under that for England and Wales, and 24 per cent. under that for Scotland. At the same time, the figures showed, when compared with the period 1866–70, that, though the infant mortality rate for Ireland had decreased only 4 per cent. and Scotland 7 per cent., that for England and Wales had decreased 30 per cent. As compared with 1866–70, the mortality from tuberculosis in Ireland in 1911–15 showed a decrease of 13 per cent., while the decrease in England and Wales and Scotland amounted to 56 per cent. in each case. The mortality from cancer showed a strong tendency to increase, but the average rate for Ireland was lower than that of any of the three countries. In 1911–15 it was 86 per 100,000 of the population, as compared with 105 for England and Wales and 110 for Scotland.

Sydney.

ROLL OF HONOUR AT THE SYDNEY HOSPITAL.

A ROLL of Honour comprising the names of 131 members of the staffs of the Sydney Hospital was unveiled on November 28th last by Mr. D. Storey, the Acting Minister of Public Health. The Roll, which is hung in the main vestibule of the hospital, is of beaten copper, surmounted by the coat-of-arms of the hospital. The Roll includes the names of Dr. W. Chisholm and Dr. T. Fiaschi of the honorary medical staff; Dr. J. B. Nash, a member of the board of directors, and forty six of the medical staff, four of whom have died on active service—Dr. B. Pockley, the first to be killed at Rabaul; Dr. J. K. Donaldson, Dr. A. C. Jekyll, and Dr. W. R. Aspinall. Of the nursing staff forty-seven, including the matron, have gone on active service. Mr. Storey, who was introduced to the gathering by Dr. A. J. Brady, said it was a great privilege to have the honour of performing the ceremony to commemorate for all time the memories of those who had gone to other regions, and also to have a reminder of those still giving their services to assist in restoring the wounded to health. He did so with the most affectionate and profound reverence to the memory of those who had gone, and admiration for those still at work in the various arenas of war, and with the hope that those still on active service would soon be back again in Australia safe and sound.

MENTAL DEFICIENCY.

A pamphlet has recently been issued from the Government printing office, entitled *Mental Deficiency: a Medico-Sociological Study of Feeble-Mindedness*, by Sir Charles Mackellar, M.B., and Professor D. A. Welsh, Professor of Pathology in the University of Sydney. Sir Charles Mackellar estimates from the statistics of actual insanity that, in the Commonwealth, there are about 20,000 mental defectives, and in New South Wales probably not fewer than 5,000, that is including not only adults but also the children attending the public schools, and many who have

not yet reached the school age. It is contended that crime, prostitution, illegitimacy, drunkenness, and pauperism are constantly recruited from the ranks of the uncontrolled feeble-minded, whose defective brain power renders them unable to inhibit the impulses leading them to violence and indulgence that have very baneful results for the community in which they live. The authors call for legislation to enable the State to take control of the feeble-minded, so as to give them the opportunity of living as useful a life as possible, and at the same time to prevent them from passing on their defective mentality, with all its possibilities of evil, to a new generation. They advocate the life-long detention of mental defectives in farm colonies. While it is recognized that this is a matter of the utmost importance it is not probable than any legislation on these lines will be passed for some considerable time to come.

THE EARLY TREATMENT OF CANCER.

The Department of Public Health is taking an important step in the direction of bringing the subject of cancer, especially its early symptoms and signs, before the general public of New South Wales. The contents of a poster, which is to be attached to public buildings, emphasizes the fact that the only cure for cancer at present known is its early and complete removal. The co-operation of the profession and the public is necessary to secure early recognition. Stress is laid on the fact that cancer in its early and curable stage usually gives rise to no pain or symptom of ill health, though it shows itself in its commonest situations by certain obvious signs. A list of striking symptoms and signs well known to the profession as indications of early cancerous disease is given, and persons who have any of them are urgently advised to consult a doctor without delay. The concluding paragraph states that, though there is no evidence that cancer is communicable from one individual to another, it is desirable that rooms occupied by a person suffering from cancer should be disinfected from time to time and kept scrupulously clean.

Correspondence.

CHARACTERS OF HUNTINGTON'S CHOREA.

SIR,—If you can spare me a few lines more on this malady may I briefly describe another case, superficially resembling that of Huntington's chorea but in nature wholly different from it? A day or two after my dispatch to you of the revised proof of my note on Huntington's chorea I made my official visit to our Heart Hospital at Colchester. Among the soldiers paraded, a man entered the consulting room who for a few moments might have been regarded as a case of Huntington's disease; but for a few moments only. The man had been buried under shell explosion, and suffered a severe shaking. It is true that he tottered and shuffled into the room quavering in all his limbs, and that his movements were tremulous and vacillating. Notwithstanding, when the man came to a stand, it was apparent that the quaverings were rhythmic and symmetrical; the knees, for instance, oscillated thus together to and fro—between three and four times a second; no "Puck-like-twitches." When told to sit down at ease he became more tranquil, and in a minute or two the trepidations diminished almost to quiescence. He could now extend his arm with no more than the atonic tremors of any debilitated man. When asked to write his name, he went to the table, took up a pen, still with no more than simple tremor, and wrote his name in a good steady hand without sign of twitch or jerk in the script. Such distinctions as these seem to me to deserve some emphasis.—I am, etc.,

Cambridge, March 30th. CLIFFORD ALLBUTT.

"PANCREATIC INSUFFICIENCY."

SIR,—The article in your issue of March 30th, p. 376, raises an important point—namely, the diagnosis of pancreatic insufficiency. I agree that the condition can only be detected with certainty by laboratory methods. There is another question, however—namely, why patients suffering from that condition are to be allowed an extra ration of meat and fat? The pathology of the disease, and my clinical experience of it during the past ten or twelve years, both suggest that this is unnecessary and, indeed, harmful. Such patients usually do best when their protein is supplied chiefly in the form of casein and gelatin, and their fats are taken in the form of milk, yolk of egg, cod-liver oil, and emulsified fats, as I have pointed out elsewhere.[1] More than a very limited amount of lean meat, with a little butter, is not required. With a diet on these lines and the help of some reliable preparation of pancreas digestion and absorption are generally well carried out, so that the patient's physical condition improves, and, moreover, there is no economical loss to the community such as a diet like that the Food Controller's advisers seem to think advisable would entail. In some instances cream is well borne, and may, in fact, be regarded as an essential food, as it is in some cases of diabetes. I am therefore sorry to see that the permission to prescribe it under special circumstances has been withdrawn, and am certain that it will have harmful consequences.—I am, etc.,

London, W., March 31st. P. J. CAMMIDGE.

GENERAL ANALGESIA BY ORAL ADMINISTRATION.

SIR,—In the JOURNAL of March 9th (p. 301) my statement that a "65 per cent. solution of ether in oil will *not* produce post-anaesthesia dysentery or bloody diarrhoea" is questioned; the writer states that his cases had these symptoms and that consequently he had not used the method between 1913 and 1917. Previous to 1913 I used a 75 per cent. solution. In April, 1915 (*American Journal of Surgery*), I published an article giving the maximum dosage as 8 oz. of a 65 per cent. solution, the usual amount for an adult being 6 oz. If diarrhoea occurs, there is faulty technique somewhere, either the oil and ether is not well shaken up or there has been too many enemas beforehand or unnecessary irrigation afterwards. The 65 per cent. solution is not irritating to the lower bowel. The writer has personally had three anaesthetics—two nitrous oxide and one colonic, and decidedly prefers the latter. The article on oral analgesia is a preliminary statement. The technique will undoubtedly be modified. But all of the anaesthetics are safer in the analgesic stage, as in this stage you are separated from the danger zone by "anaesthesia"; oral (ether) analgesia is safer than nitrous oxide and oxygen anaesthesia, even when given under the most auspicious circumstances. Subcutaneous ether-oil analgesia has been successfully used since the article referred to was published, and will unquestionably be used in the laboratory in preference to inhalation anaesthesia, but oral analgesia is preferable, and in conjunction with morphine will enable the ambulance surgeon to do more for his patients than heretofore. By using the most powerful analgesic—morphine—in conjunction with the analgesic qualities of ether (orally) and nitrous oxide (by inhalation) we have a combination that approaches the ideal.—I am, etc.,

March 13th. JAMES T. GWATHMEY, Captain M.R.C., U.S.A.

MEDICAL REINFORCEMENTS FOR THE WESTERN FRONT.

SIR,—In the JOURNAL of March 30th, p. 375, your appeal to medical men to offer their services during the present emergency is certainly very touching, and will meet with the full sympathy of the whole profession. It is not, however, likely to meet with its full support unless some means are adopted for safeguarding the interests of those who are already serving. It would be a serious matter for a man of 50 years of age whose practice is his living to join the army, and have only to look forward to the declaration of peace as the time when he will have to start a fresh practice. As matters stand at present this could be his only fate, judging by what has happened to the majority of the men who have already joined. Men of military age have hitherto chiefly been affected, and in most cases after the war will still be young enough to start a new practice. With the older men it will be different, and I consider it would be a cruel return for their generous patriotism to accept their offers of voluntary military service.

[1] *The Faeces of Children and Adults*, p. 467.

Surely it is not too much to ask for at least the same protection as business men now get—namely, "that no new business, or trade, or shop be allowed to be opened during the war"; and I believe it is the duty of our Association to do all it can for the protection of its members. I would suggest that during the war no one be allowed to start a medical practice without a special permit from the Ministry of National Service, and that this permit be not granted without the sanction of the local Division of the British Medical Association of the area in which the proposed practice is situated.

As a class the medical profession is loyal and patriotic, and if their interests were as far as possible safeguarded, your appeal would meet with a hearty response from its members. Your appeal is undoubtedly urgent, but not more so than the present matter, which, indeed, should have prefaced it. If the Association will get this promptly carried out it will be doing a real service to the medical men already in the army as well as giving some encouragement to those who are about to join.—I am, etc.,

Glyn Neath, Glamorganshire, April 2nd. S. McCLURE.

MEDICAL OFFICERS OF RESERVE BATTALIONS.

SIR,—It is a surprise to me that even now, when our armies are in great need of medical officers, the time of so many men should still be wasted in this country in the Reserve battalions which do not proceed to the front, but supply drafts. Surely one medical officer could easily find time to act for two battalions instead of one, and yet be less heavily worked than most of the civilian medical men. I feel quite sure that a very short experience would prove the truth of this, and it surprises me that the Central Medical War Committee does not press this point on the War Office.

Any further depletion of medical men must act injuriously, not only on civilians, but also on the health of those members of our profession who are striving day and night to carry on their work; and this loss of health will still further increase the dearth of medical men left to attend the needs of the civilian population.—I am, etc.,

P. L. GIUSEPPI, M.D.Lond., F.R.C.S.

Felixstowe, April 2nd.

PRIMARY SUTURE OF WOUNDS AT THE FRONT IN FRANCE.

SIR,—Will you kindly allow me to draw attention to a printer's error in your report of my address on primary suture?

I am made to say: "It is not clear that delay in reaching a casualty clearing station may be unavoidable." This should read: "Is it not clear that delay in reaching a casualty clearing station may be unavoidable?"—I am, etc.,

March 25th. ANTHONY BOWLBY.

THE PULSE-PRESSURE TEST BEFORE OPERATIONS.

SIR,—Just forty years ago in the Edinburgh Infirmary I took pulse tracings during operations. I possess one set of tracings now. They show that when the first incision was made, when the thigh was sawn through, and when each nerve in the flap was cut short, a marked fall in the pressure occurred.—I am, etc.,

London, E.C., March 26th. A. OGIER WARD.

IN four of the universities of Switzerland the official language is French and in three it is German. Although there is a large Italian-speaking population there has hitherto been no university in which Italian is the official language. Some time ago a wealthy inhabitant of Ticino, Signor Romeo Manzoni, bequeathed the whole of his fortune to the government of the canton for the foundation of an Italian-speaking university. His example was followed by a number of other benefactors and a fund of several millions of francs has been collected. The authorities of Ticino have taken the first steps towards the fulfilment of Signor Manzoni's wish by founding a superior school of Italian culture in Ticino. It is divided into several sections which are intended to form the nucleus of a university.

Obituary.

WE regret to record the death of Mr. R. H. B. NICHOLSON, consulting surgeon to the Hull Royal Infirmary. He was the son of a medical practitioner in Hull, and spent the whole of his life in that city. He received his medical education at the Hull and East Riding Medical School, where he held the appointment of demonstrator of anatomy. He took the diplomas of M.R.C.S.Eng. and L.S.A. in 1862. He became assistant surgeon to the infirmary in 1876, surgeon in 1886, and consulting surgeon in 1901. From an early date he took a great interest in the affairs of the British Medical Association, was a member of the Committee of Council, and after the reconstitution in 1883 was for many years a member of the Central Council, and served on numerous committees, including the Parliamentary Bills Committee and the Journal and Finance Committee. He did not write much, but contributed several papers on clinical surgery to our columns. He took an active part in establishing the Jubilee Nurses' Home, and had been chairman of its executive committee for many years. He was also surgeon to the Lying-in Charity and to the Withernsea Convalescent Home. He was one of the pioneers of sanitation in the city, and in association with Mr. J. A. Spender, then editor of the *Eastern Morning News*, founded the Hull Sanitary Association, which stimulated the corporation to action. He also took a leading part in promoting improvements in housing, and in these ways contributed much to bring about the present healthy state of Hull. Mr. Nicholson was a man of handsome presence and genial manners, and his kindness of heart endeared him to many, including a large number of members of the Association, who for many years were accustomed to meet him at every annual meeting. He leaves a widow and three sons, one of whom, Mr. Guy Berners Nicholson, assistant surgeon to the Hull Royal Infirmary, holds a temporary commission as captain in the R.A.M.C., and is serving in France.

DR. KENNETH SCOTT, who died on February 19th after an operation for appendicitis, was the only son of Mr. Thomas Graham Scott, of Edinburgh, and was born at Morton Bingley, Yorkshire. He was educated at the Edinburgh Academy, at the University of Edinburgh, and at King's College, London. He took the diploma of M.R.C.S. in 1887, and graduated M.B., C.M.Edin. in the same year with honours. Two years later he took the F.R.C.S.Edin., and was appointed lecturer in ophthalmology at the Egyptian Government Medical School, Cairo, and ophthalmic surgeon to the Kasr-el-Ainy Hospital. These posts he held for ten years, and from 1900 to 1906 he was honorary secretary of the Cairo Blind School, of which he was the organizer. On relinquishing his Egyptian appointments, he started in ophthalmological practice in London, and from 1907 to 1909 was lecturer on ophthalmology at the West London Post-Graduate College. He was also appointed consulting ophthalmic surgeon to St. Mary's Hospital for Women and Children, and on the outbreak of war became medical administrator of the City of London Red Cross Hospital. Dr. Scott made few contributions to medical literature, but a paper read before the Egyptian Medical Congress in 1902 on exact methods of visual examination, showed the practical side of his mind, and the tendency which led to his future success. After settling in London he rapidly attained a practice which during the few years before his death was almost greater than the strength of one man could manage. His health was not good, but his devotion to his work, and the determination never to allow his ideal of exactitude to be lowered enabled him to face with success his laborious life. He was a man of charming manners, a delightful colleague, and held in very high estimation both by his professional brothers and his patients.

DR. GEORGE BELBEN FLUX died in the Royal Free Hospital, London, on March 18th. He was educated at King's College Hospital, and took the diploma of L.S.A. in 1887 and those of M.R.C.S. and L.R.C.P.Lond. in 1888. He took the degree of M.D.Brux. in the same year and

the M.D.Durh. in 1904. After acting as resident medical assistant at Nottingham General Hospital, he settled in London. He became anaesthetist to the Great Northern Central Hospital and to the National Dental Hospital, and afterwards to the British Lying-in Hospital and King's College Hospital. He had contributed many articles on anaesthetics to the medical journals. He took a temporary commission in the R.A.M.C. in April, 1917, but was invalided out in the following December.

DR. GEORGE WILLIAM SHIPMAN of Grantham, one of the best known medical practitioners in Lincolnshire, died on March 24th, at the age of 70. After studying medicine at Guy's Hospital, he obtained the diplomas M.R.C.S., L.R.C.P. in 1869, and soon afterwards joined his father in practice at Grantham, where he took for many years a leading part in public life, holding the office of mayor of the borough and J.P. for the county. For more than thirty years he served as medical officer to the Lincolnshire Regiment of Militia, and retired with the rank of surgeon-lieutenant-colonel in 1900. Dr. Shipman took an active share in founding the Grantham Hospital, and served as surgeon for twenty-six years. He was the first chairman of the Kesteven Division of the British Medical Association, first chairman of the Grantham Medical Society, and a former president of the Lincolnshire Medical Benevolent Society. His loss is deeply felt by a wide circle of colleagues, patients, and friends.

Universities and Colleges.

UNIVERSITY OF EDINBURGH.

THE following candidates have been approved at the examination indicated:

FINAL M.B., CH.B.—Eva M. Clark, H. R. Goldberg, W. A. Gray, Martha L. Hamilton, W. G. Hughes, G. Lange, D. O. Macdonald, H. B. Mackenzie, A. R. C. M'Kerrow, J. S. Mann, D. J. Micah, J. C. Morris, Annie C. Roberts, G. M. S. Smith.

UNIVERSITY OF DURHAM.

THE following candidates have been approved at the examination indicated:

THIRD M.B. (*Materia Medica, Pharmacology, and Pharmacy; Public Health; Medical Jurisprudence; Pathology and Elementary Bacteriology*).—*J. R. Hughes, Sujan Raj Chatterji, Nan Coxon, L. W. Hearn, J. Hetherington, R. Sanderson, Habib Toma.

* Second class honours.

UNIVERSITY OF MANCHESTER.

THE following candidates have been approved at the examination indicated:

THIRD M.B., CH.B. (*General Pathology and Morbid Anatomy*).—May Ashburner, Mary E. Boullen, Mary S. Jones, J. F. O'Grady, E. Piggott, A. el H. Sadek.

UNIVERSITY OF DUBLIN.

THE following candidates have been approved at the examinations indicated:

FINAL M.B., PART I.—*Materia Medica and Therapeutics, Medical Jurisprudence and Hygiene, Pathology*: *J. H. Coolican, *W. A. Byrn, R. Counihan, N. Long, A. R. Aidin, W. J. Hogan, J. T. Mynhardt, †J. W. Scharff, †D. S. Prentice, †C. H. Keller.

FINAL M.B., B.CH., B.A.O., PART II.—*Medicine*: *H. L. Parker, V. M. Synge, J. C. Fouché, E. E. Rollins, R. M. D. Devereux, J. B. McGranahan, P. A. Dormer, E. F. Wilson, J. M. Hill, T. H. R. McKiernan, F. A. McHugh. *Surgery*: T. M. Bentley, L. Albertyn, F. Gill, A. L. Gregg, W. L. Young, J. G. Bird, R. W. Nesbitt, F. A. McHugh. *Midwifery*: W. F. McConnell, W. Sweetnam, E. F. Wilson, J. B. McGranahan, J. W. Scharff, D. S. Prentice, R. B. N. Smartt, W. A. Shannon, D. McElwee, B. D. Merrin, F. A. McHugh.

D.P.H., PART I.—R. A. Keane.

* High marks.
† Pathology completing examination.

CONJOINT BOARD IN IRELAND.

THE following candidates have been approved at the examination indicated:

FINAL PROFESSIONAL.—W. Evans, C. K. T. Hewson, P. J. O'Connell, M. M. Price, P. K. I. Ryan, J. C. Smyth, J. G. Thornton.

Medical News.

THE Admiralty has under consideration a proposal to use Larbert Asylum, near Glasgow, for a naval hospital. The number of sick and wounded it would accommodate is about twelve hundred.

THE Colonial Office has issued the twentieth edition of a leaflet (No. 678) giving information of a general character for the use of candidates for appointments on the West African Medical Staff.

THE first number of a new journal devoted to the interests of the (United States) Indian Medical Service was published recently. Its object is to raise the service to the level of the Army, Navy, and Public Health Services.

PROFESSOR S. G. SHATTOCK, F.R.S., will give three demonstrations during April at the Royal College of Surgeons of England. On April 8th, on foreign bodies; on April 15th, on necrosis; on April 22nd, on malignant tumours. The demonstrations, which will be given at 5 p.m. each day, are open to medical students and practitioners, and also to first-aid and ambulance students.

THE Röntgen Society has recently founded an annual lecture in memory of its first President, the late Professor Silvanus P. Thompson. The first will be delivered by Professor Sir Ernest Rutherford, F.R.S., at a meeting of the society, at Burlington House, on Tuesday next, at 8 p.m. Cards of admission can be obtained from the honorary secretary, Dr. S. Russ, Middlesex Hospital, London, W. 1.

MR. RAYMOND JOHNSON, surgeon to University College Hospital, in seconding a motion for the adoption of the report at the annual meeting, drew particular attention to the good work done during the year in the child welfare section of the hospital. He mentioned also that 250 beds had been assigned for sick and wounded soldiers and sailors. At this meeting two ladies, H.H. Princess Marie Louise and Lady Owen Philipps, were elected members of the General Committee.

THE Air Ministry has announced in the *London Gazette* that all officers serving with the Royal Naval Air Service and Royal Flying Corps on March 31st, 1918, or in connexion with those services, with certain exceptions, are granted temporary commissions in the Royal Air Force with effect from April 1st, 1918. The specified exceptions include medical officers. It is understood that these will be seconded to the Royal Air Force from the Royal Naval Medical Service and the Royal Army Medical Corps.

IN its annual report, recently presented to the State Legislature, the New York State Hospital Commission recommends the adoption of vigorous measures for the prevention of mental disease. The insane cost the State £1,676,400 in 1917, and the Commission expresses the opinion that one-half of the cases are preventable. The measures recommended are: the checking of alcoholism and syphilis, better instruction of the public in mental hygiene, the suppression of extreme poverty, and extension of the out-patient department of State hospitals with more free clinics for mental and nervous disorders and "field agents" to look after incipient and convalescent cases.

THIRTY cases of luxation and avulsion of the eyeball during birth have been published. In four instances the labour was natural, in two the labour was difficult, and in two the orbit was mistaken for the rectum and the eye dislocated by the finger of the accoucheur. All four eyes were lost. In the remainder of the cases the labour was instrumental, and the eye was displaced by the forceps. In two only was the eye replaced with preservation of vision. In one of these the eye was enucleated by the finger of the midwife, who was under the impression that she was dealing with a breech presentation and exploring the anus. H. Friedenwald had recorded another case in the *American Journal of Ophthalmology*, vol. i, No. 1. The left eyeball was completely luxated by the blade of the forceps and the lids were closed behind the eye. An incision was made at the outer canthus and the eye replaced. Two years later the eye was healthy and had good vision. In a number of cases the infants have died from the severity of the head injuries, and many eyes which have been replaced have been lost from panophthalmitis. When reposition is considered possible, it is necessary to remove any fragments of bone from fractures of the orbit, for which purpose Kroenlein's operation may be necessary. Canthotomy is nearly always called for. It has been held that no blame attaches to the obstetrician when the accident results from the forceps.

Letters, Notes, and Answers.

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

Authors desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

The telegraphic addresses of the BRITISH MEDICAL ASSOCIATION and JOURNAL are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London*; telephone, 2631, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London*; telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Medisecra, Westrand, London*; telephone, 2634, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin.

The address of the Central Medical War Committee for England and Wales is 429, Strand, London, W.C.2; that of the Reference Committee of the Royal Colleges in London is the Examination Hall, 8, Queen Square, Bloomsbury, W.C.1; and that of the Scottish Medical Service Emergency Committee is Royal College of Physicians, Edinburgh.

LETTERS, NOTES, ETC.

THE following appointment for certifying factory surgeon is vacant: Dudley (Worcester).

DOUBTFUL WATER.

IN dealing on a small scale in an emergency with doubtful water by the addition of a solution of chloride of lime, Schell and Parsy recommend, in order to get rid of the excess of hydrochlorite shown by the starch test, that the water should be stirred with a packet of iron wire. Peroxide of iron is formed and is deposited; in about half an hour the water has lost any disagreeable taste due to the chlorine.

RECORDS OF PHYSICAL TREATMENT.

THE War Disablement Committee of the Royal Society of Medicine (Section of Balneology) has resolved to place at the disposal of all practitioners making use of physical treatment for disabled soldiers cards for recording results of such treatment, including baths and electricity, provided they are ultimately returned filled up. A collection of the cards is being made from spas and health resorts to form the basis of a special chapter in the medical history of the war. Cards can be obtained from Messrs. Adlard and Son, 23, Bartholomew Close, E.C., price £2 per thousand.

SANATORIUM TREATMENT OF THE TUBERCULOUS SOLDIER.

DR. J. HORNE WILSON (London, W., late Captain R.A.M.C.), writes with reference to recent correspondence as to the tuberculous soldier: It is probably true, as Dr. Camac Wilkinson states, that not even 10 per cent. of the cases can be benefited by sanatorium treatment, and therefore other methods must be tried which hold out more hope than the domiciliary treatment hitherto offered to the 90 per cent. remnant. I agree that early diagnosis with tuberculin, properly interpreted, would lead to prompt treatment of early cases before tubercle bacilli appeared in the sputum, and it is my experience and opinion that tuberculin in its various forms offers a solution of the difficulty in a large percentage of the cases, and ought at least be given a fair trial. Such a method rarely necessitates loss of employment by the patient, and from an economic point of view the cost to the country would be reduced to a minimum.

TREATMENT OF MENINGITIS.

MRS. FYSH, M.B.Lond. (Dryhurst, Tonbridge), writes to recommend the following treatment of meningitis: As soon as the diagnosis is made, shave the head and paint it all over with tincture of iodine. Repeat the painting daily, or every other day, as the skin can bear it. Keep the bowels acting with small doses of calomel when required. Give a diet carefully arranged so as to spare the digestive organs as much as possible—in infants making the food, of course, more dilute than in health, and using it partially predigested. Combine with these things tepid sponging regularly every six hours; this is a most important part of the treatment. By the above method I was able to save three cases out of four during the last year I held the post of medical officer in charge of the Lady Havelock Hospital in Colombo.

BARLEY BREAD IN ANTIQUITY.

ACCORDING to Pliny, "barley (husked) was the most ancient meat in old times," and this statement seems to be borne out by the fact that three varieties (*Hordeum distichum, H. hextastichum densum*, and *H. hextastichum sanctum*) have been found in lake dwellings in Switzerland in deposits belonging to the Stone Age. Athenian athletes trained on barley; it was the ordinary food of gladiators, who, from the allowance of the grain made to them, were called *hordearii* (barley men). Of barley bread Pliny says, that "though so much used of our forefathers in old time, the posterity that lived after found to be naught and condemned it: in such sort as they allowed it for provender only to feed their beasts and cattel with" (*Plinies Naturall History*, Bk. 18, Philemon Holland's Translation). So much was barley bread disliked and despised by the Romans that it was issued as a ration by way of punishment to soldiers who had misconducted themselves before the enemy. Plutarch tells us that when some legions ran away at the battle of Canusium the Pro-Consul Marcellus as a part of their punishment "appointed they should give those that first turned their backs to Hannibal barley for wheat." Livy says the same penalty was inflicted on cohorts which lost their standards, for it was regarded as a great disgrace to be given this "food of gladiators." According to Suetonius, Caesar Octavius, who was a strict disciplinarian, revived this old punishment for cowardice. Though in the Gospel of St. John (vi, 9) it is recorded that Christ fed the multitude which followed him on five barley loaves and two small fishes, there is evidence that the Jews looked upon barley bread as unfit for human food. In an anecdote quoted from the Talmud by Dean Farrar in his *Life of Christ* it is related that when Johanan said, "There is an excellent barley harvest," the answer he got was, "Tell that to horses and asses."

BOTHRIOCEPHALUS LATUS IN IRELAND.

DR. O'FARRELL reported to a recent meeting of the Section of Pathology of the Royal Academy of Medicine in Ireland a second case of *Bothriocephalus latus*. His first (BRITISH MEDICAL JOURNAL, 1916, vol. i, p. 309) occurred in a man who resided on the river Shannon. The new case was in a young woman who resided about fifteen miles higher up the same river.

THE METRIC SYSTEM IN DISPENSING.

DR. KEITH ROBERTSON (Greenock) writes: Dr. Sydney Whitaker, in your issue of February 23rd, 1918, p. 248, makes a plea for uniformity in the use of metric symbols. Using the metric system entirely in prescribing, as I now do, it seems to me that to avoid mistakes and ambiguity, and to enable one easily to memorize a dose, it would be best to deal in grams and millilitres only, and decimals of these. To put down 6 dcg. instead of 0.6 gm. is to give the brain unnecessary work in mental arithmetic. A decigram should always be put down as 0.1 gm., a centimil. as 0.01 mil., and so on. Further, it would be well if we dropped the gm. or mil. altogether, and wrote simply 0.03 for three centigrams or centimils., according to whether we were dealing with solids or liquids, using the definite designation only where there might be doubt. Dr. Whitaker's prescription would be written thus:

℞ Vin. colchici...	...	1
Mag. carb. pond.	...	0.6
Mag. sulph.	...	1
Aq. menth. pip.	ad	30

When our dispensers get measures, weights, and bottles to suit, we will be in a still better position, and the work will be easier for them. For instance, I might write a prescription such as the above, only instead of aq. menth. pip. ad 30 mil., make it ad 20 mil. (or 10 if you like) and direct ten or twenty doses to be sent. For ten doses the dispenser simply removes the decimal point one cipher to the right; for twenty he does the same and multiplies by 2, then dispenses in a 200 or 400 mil. bottle. If then the patient is supplied with a metric medicine measure, the dosage is correct; the uncertainty of "tablespoon" quantities is done away with, and education in the metric measures is of a practical kind.

MILITARY HOSPITAL SERVICE IN THE AMERICAN REVOLUTION.

THE first plan for the organization of a military hospital service during the American Revolution was drawn up by Dr. William Shippen of Philadelphia and transmitted to Congress on February 14th, 1777. Besides director-generals and assistants for each of the northern, middle, and southern districts, provision was made for an apothecary-general, "whose duty it is to receive, prepare and deliver medicines and other articles of his department to the Hospital and ye Army as shall be ordered by ye Director General" and "for Apothecary and Mates to obey ye Apothecary General." The *New York Medical Journal* of February 23rd, which is our authority for these statements, states that Congress has now before it three bills providing for the organization of a pharmaceutical corps in the medical department, and the Surgeon-General has appointed a committee to consider the proposal. In Dr. Shippen's plan provision was made for one nurse for every fifteen sick and a matron to every hundred.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

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Seven lines and under	0	6	0
Each additional line	0	0	9
Whole single column	4	0	0
Whole page	12	0	0

An average line contains six words.

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NOTE.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers.